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THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

REPUBLIC TRUCKS

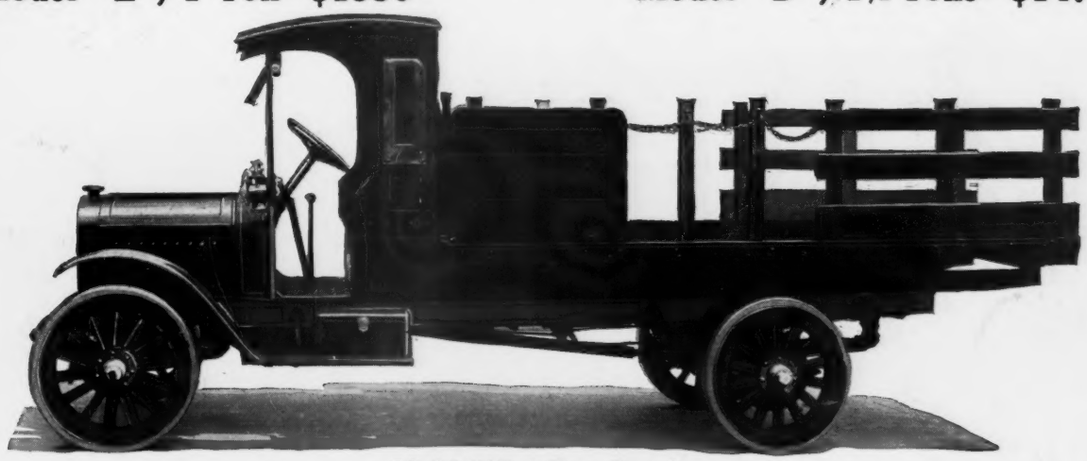
offer dealers one of the few really great opportunities to make abundant profit *now* and to build a substantial business for the future. The success of the Republic and of those who sell it are both too well known to require repetition. Each is an earned success, based on honest policy, high quality, great values and the ability to economically perform the service the trucks are called upon to do.

(Internal Gear-Drive Models)

Model "F", ¾ Ton Complete with Express Body **$995** **Model "A", 2 Tons** (Chassis) **$1575**

(Chain-Drive Models)

Model "L", 1 Ton—$1350 **Model "D", 1½ Tons—$1475**



Model "A", 2 Tons Capacity

A few more dealers can share in this success. Will you be one?

REPUBLIC MOTOR TRUCK CO., Alma, Mich.

"The Honest Truck at an Honest Price"

PUBLISHED THE 15TH OF EACH MONTH
CHILTON COMPANY
MARKET & 49TH STS. PHILADELPHIA

CHASE

THE WORM DRIVE LINE

Construction

is the gauge of value when you contemplate the purchase of a motor truck—construction that accumulates rather than depreciates, throughout the life of the car.

CHASE
Motor Trucks

bear out this construction—reflect the engineering ability—the mechanical superiority of one of America's pioneer truck builders.

Designed to meet the practical hauling needs of every known class of business, these cars offer a wide use.

Water-Cooled Motor—Worm Drive
Extra Heavy Frame—Unit Power Plant

A flexible line of Models, ranging in capacity from 1000 to 7000 lbs., $750 to $3300. *Write for literature.*

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104 West Street **Syracuse, N. Y.**

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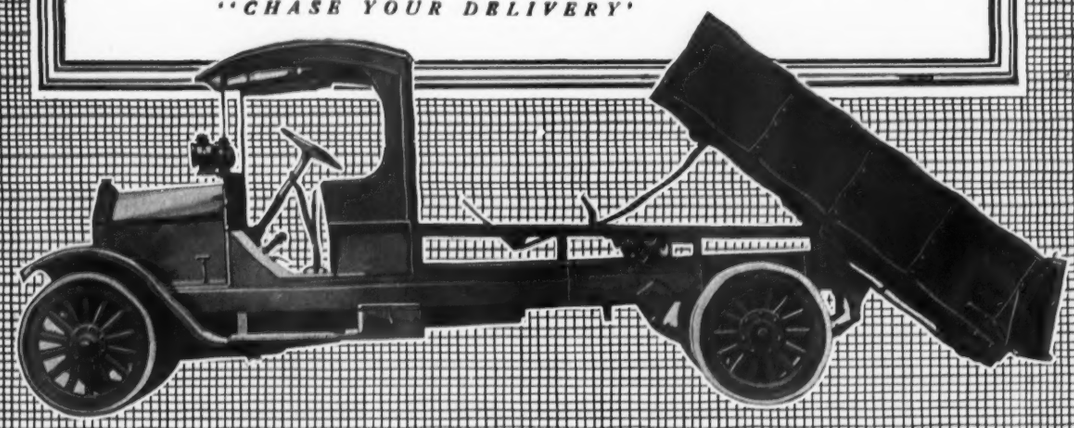

THE PUBLISHERS' PERSONAL PAGE

"Truth Needs No Flowers of Speech"

We agree with Pope that "truth needs no flowers of speech," but truth, nevertheless, must occasionally be brought to the attention of those who will be benefited by it. We, therefore, take this occasion briefly to state some facts concerning the Commercial Car Journal.

The CCJ has completed its first four and one-half years of existence. In that time it has gradually but surely won its place as the leading truck publication. At the present time, after these years of conscientious and systematic work on the part of all connected with the paper, it enjoys the largest circulation of any truck paper in the field, and carries more business each issue than any other.

IF a trade paper treats its news in a truthful, straightforward manner, nothing trashy or sensational—

If its editorial views reflect sound common sense, expressed with dignity and restraint—

If its typography and presswork show care and skillful workmanship—

If its advertising columns display the names of clean, reputable concerns—

You know at once that that trade paper goes to the worth-while buyers of America.

Such a trade paper is the CCJ. Its strongest supporters are the big men of the industry. *For this reason advertisers can employ it profitably.*

THE COMMERCIAL CAR JOURNAL

We have endeavored to give to our readers the worth-while matter in a dignified and truthful manner. We have tried to point out practices which we believed to be injurious to the industry, and to suggest corrective methods for such practices. We stand at all times for sound, meaty information, and our columns are free from sensational matter, or what is commonly known as "hot air." That this policy is appreciated by our readers is apparent from the results. If you are not already a subscriber, become one at once. There is no time like the present, and knowledge of your particular industry is power.

CHILTON COMPANY, Publishers

The Experience of E. Bradford Clarke Co. who own three Autocars

The well-known grocery house, E. Bradford Clarke Co., 1520 Chestnut St., Philadelphia, use three Autocar Delivery Vehicles for city and suburban service. These Autocars average 50 miles per day and reach a radius covering Paoli and Fort Washington. Each car displaces 6 horses. Their experience covers over four years, during which time they have found Autocars prompt and reliable at all times, and the means of increasing trade in sections that could not be reached with horses.

Write for illustrated catalog and list of over 2600 concerns using Autocars in every line of business.

Chassis Price, $1650

THE AUTOCAR COMPANY

Ardmore, Pa.

Established 1897 MOTOR CAR DELIVERY SPECIALISTS

The Commercial Car Journal

VOLUME X | PHILADELPHIA, SEPTEMBER 15, 1915 | NUMBER 1

YEAR'S AUTOMOBILE EXPORTS $67,000,000, WHICH IS DOUBLE THAT FOR THE PREVIOUS TWELVE MONTHS

Figures Show Exports of 13,996 Trucks and 23,880 Passenger Vehicles, Valued at $60,254,635, With Parts Valued at $7,000,000, as Against $33,000,000 for Previous Period

Figures for automobile exports from the Department of Commerce at Washington with information compiled by the National Automobile Chamber of Commerce, show that for the year ending June 30th American manufacturers exported 37,870 motor vehicles, valued at $60,254,635, with parts valued at $7,000,000, making the total exports of the automobile industry $67,254,635, an increase of more than 100 per cent. over the sales for the previous twelve months, which amounted to $33,198,806.

While the greatest increase has been in trucks to European countries, passenger car exports to Europe show a substantial increase, although there was a falling off to South America and Canada. The United States exported 13,996 trucks, valued at $39,140,682, and 23,880 passenger or pleasure motor vehicles, valued at $21,113,953, with parts valued at approximately $7,000,000 making a grand total of $67,254,635.

By appealing to all classes of buyers and giving those wonderful values that obtain from scientific engineering, manufacturing and selling, this country has made giant strides in the manufacture and distribution of motor cars, now such important factors in everyday life, until it is supplying the demands of the entire world and creating a reputation for the American product that assures permanent leadership.

The United Kingdom was the best customer, taking 13,934 trucks and passenger cars, valued at $21,149,000, with France the next heaviest buyer with 5441 vehicles, valued at $13,776,000.

Other Europe, which includes Russia, purchased 4249 vehicles, valued at $10,720,000.

Last June was a record month, with the astounding figures of 2990 trucks and 4418 passenger cars, valued at $13,364,000, which, with the extraordinary sale of cars in this country, gives ample evidence of the wonderful productive capacity of the American motor car builders.

The following interesting figures are taken from the reports of the government and the National Automobile Chamber of Commerce, the organization of motor car manufacturers:

Exports for Twelve Months ending June 30

13,966	motor trucks, valued at..	$39,140,682
23,880	passenger cars, valued at.	21,113,953
37,870	motor vehicles, value....	$60,254,635
	Parts (not including tires and engines) approximately	7,000,000
	Total value of exports...	$67,254,635

784	trucks in previous twelve month, value	$1,181,611
28,306	passenger cars in previous twelve month, value ...	25,392,963
29,090	motor vehicles, value.....	$26,574,574
	Parts, value	6,624,223
	Total	$33,198,806

Exports for the year ending June 30th are more than double that of the previous period.

13,934	vehicles to United Kingdom, value	$21,149,000
5,441	vehicles to France, value.	13,776,000
4,249	vehicles to Russia and other Europe, value....	10,720,000
2,316	vehicles to Asia and other Oceania	4,557,000
4,433	vehicles to Canada, value.	4,428,000
3,186	vehicles to British Oceania, value	2,670,000
1,264	vehicles to South America, value	702,000

Studebaker Corp., of Detroit, reports new earnings for the first half of the present year to be in excess of $6,300,000, and the outlook for the second half of the year seems to be even brighter. A dividend of 1¾ per cent. on the preferred stock and 1¼ per cent. on the common stock has been declared.

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NATIONAL ASSOCIATION OF AUTOMOBILE JOBBERS GAINS 86 PER CENT IN MEMBERSHIP

The National Association of Automobile Jobbers has made wonderful progress since the meeting of July 21st and has gained 86 per cent. in membership. The next meeting will be held at Excelsior Springs, Mo., October 20th, 21st and 22d. The company announces that it is not only a middle west project, but it is national in its scope, having members from the Atlantic to the Pacific, and from New Orleans and Florida to North Dakota. Any manufacturer of automobile accessories or jobber who desires information or further particulars regarding the workings of the association will be cheerfully furnished with same upon application to William M. Webster, Commissioner, 1813 City Hall Square Building, Chicago.

PACKARD BUYS MORE LAND

Packard Motor Car Co. has purchased more than 12 acres of land adjoining its plant and extending north of Harper Avenue to Mt. Elliott and Strong Aves., Detroit. This will provide space for doubling the drop forge and foundry departments. A freight receiving shed to handle heavy incoming traffic will also be erected on the new site.

WHITE COMPANY ISSUES STOCK

White Co., Cleveland, Ohio, has decided to issue $3,000,000 in new preferred stock. It will pay 7 per cent. dividends and will be offered to the present stockholders at par. The present outstanding $500,000 worth of preferred stock is to be retired from the proceeds of the new stock at $115 per share, plus accrued dividends until November 1st next. The company announces that it does not consider it good business, nor does it find it necessary to repudiate a design, nor to depreciate annually the value of cars which have been purchased from it by making frequent radical changes in design and price.

RUTENBER ERECTS NEW BUILDING

Rutenber Motor Co. has just completed the construction of four new buildings at the main plant at Marion, Ind., which will increase the floor space 25,000 ft. A large battery of automatic screw machines has just been added as well as multiple spindle drill presses, turret lathes, etc., to manufacture the smaller parts which go to make up Rutenber engines. The annual output has been increased from 12,000 to approximately 18,000 engines. All European orders have been canceled and the London agency closed on account of the unprecedented contract demands from the automobile and truck manufacturers in the United States.

The CCJ leads in circulation, advertising and prestige

DETROIT S. A. E. STARTS WINTER ACTIVITIES

The Detroit Section of the S.A.E. opened its winter session on September 16th. J. G. Vincent, vice-president of the Packard Motor Car Co., read a paper entitled "A Discussion of the Twin-Six Motor." As this subject is one of the biggest in the automobile field, at the present time, the whole evening was devoted to the one topic.

The Detroit Section was organized in 1911 by a small group of engineers, with George Dunham as chairman and George M. Holley as secretary. For several years the chairmanship was held by E. T. Birdsall, assisted for over a year by Albert Greenberg, and for two years by Herbert L. Connell as secretary and treasurer. Mr. Dunham is again in the harness for the coming year, as is W. H. Conant, who will act as secretary.

The section regularly began to have its discussions taken down by a court stenographer about three years ago, and these minutes were published in the society's monthly Bulletin. When Mr. Connell resigned last winter to take up duties in Milwaukee, the secretary's duties had become so heavy that it was found necessary to employ a paid assistant secretary to take care of the details of the office, and in order to increase the financial resources of the section Mr. Conant set out to secure the aid of several Detroit automobile manufacturers, with the result that the section now has not only an assistant secretary, but an office in the Kerr Building.

NEW MICHIGAN TRUCK LAW

The Secretary of State of Michigan has issued in booklet form the new Michigan motor vehicle law which goes into effect January 1, 1916. This new law requires motor trucks to be registered annually, each license being good for one year, expiring on December 31st of each year. When registration is made after September 1st, half rate is charged. The two number plates to be displayed front and rear are to be changed annually in color, and the owner is required to have a white light showing on the license plate. Dimmers are required on the front lights. The fees for motor trucks are 15 cents per horsepower, plus 15 cents per 100 lbs. of weight for gasoline or steam, or 50 cents per h.p., plus 25 cents per 100 lbs. of weight for electric. A 3-ton, 25-h.p. gasoline commercial car, weighing 2500 lbs. would have to pay $7.50 license fee per year, and a 5-h.p. electric truck, weighing the same, would have to pay $8.75.

FEDERAL MOTOR TRUCK COMPANY HOLDS CONVENTION

Federal Motor Truck Co. held a convention of dealers on September 2d, 3d and 4th at the Hotel Statler, Detroit. Delegates from every State in the Union were present. They have had a good year and look forward to a still better one in 1916. The convention was held to talk over the future and also to have a good time. A trip was planned to Pine Lake, a river trip and an afternoon at the ball game were also enjoyed.

E. V. A. CONVENTION AT CLEVELAND

The plans for the sixth annual convention of the Electric Vehicle Association of America, are rapidly nearing maturity. The convention will be held at the Hotel Statler, October 18th and 19th. M. R. Berry, chairman of the Exhibition Committee, reported that there seemed to be a strong demand for an exhibition of electric vehicle batteries, charging apparatus, measuring and registering instruments, tires, accessories, etc., and consequently, tentative plans are under way to hold exceedingly interesting exhibitions at the Hotel Statler. It is expected that the exhibit will prove one of the most interesting features of the convention. It might be added that an opportunity will also be given the commercial, passenger, and industrial truck and electric wheel chair manufacturers to exhibit if they so desire. Any concern or individual desiring space for exhibition purpose should communicate with Mr. Berry, Electric Products Co., 10674 Dupont Ave., Cleveland.

The partial program of papers to be read discussed at the meeting are as follows:

"Industrial Trucks in the Service of the Pennsylvania Railway Co.," by Mr. T. V. Buckwolter, Pennsylvania Railway Co.

"The Electric Taxicab," by Mr. I. S. Scrimger, Secretary and General Manager, Detroit Taxicab & Transfer Co.

"The Hartford Electric Co.'s Experience with the Battery Maintenance and Battery Exchange System," by Mr. Samuel Ferguson, Vice-President, Hartford Electric Light Co.

"The Function of the Electric Garage," by Mr. R. Macrae, of the Commonwealth Edison Co., of Chicago.

"Comparative Development of General Power and Commercial Electric Vehicle Loads and Function of Power Salesmen as Electric Vehicle Solicitors," by Mr. H. H. Holding, General Car Representative and Mr. S. G. Thompson, General Electric Vehicle Representative, Public Service Electric Co.

"Problems We are Facing and How They May be Met," by Mr. George H. Kelly, Secretary, Baker Rauch & Lang Co., and President Electric Automobile Manufacturers' Association.

"Field for the Small Electric Delivery Vehicle," by Mr. Charles A. Ward, Secretary-Treasurer, Ward Motor Vehicle Co.

"Electric Vehicles in Municipal Service," by Mr. Arthur J. Slade, Consulting Engineer, New York City.

PACKARD RECEIVES GRAND PRIZE FOR PLEASURE CARS AT EXPOSITION

Owing to an unfortunate misunderstanding some incorrect publicity has been appearing in various papers concerning awards at the exposition to the Packard Co. This company received the Grand Prize for pleasure carriages; this did not cover trucks. The Packard commercial cars received a Medal of Honor.

WHITE COMPANY AWARDED GRAND PRIZE FOR MOTOR TRUCKS

White Co., Cleveland, Ohio, has received official announcement by the Superior Jury of Award of the Panama-Pacific International Exposition at San Francisco to the effect that the grand prize for motor trucks has been awarded to that company. The decision of the jury was based upon the quality of materials entering into White construction, the excellence of design, mechanical efficiency and low cost of operation.

KELLY-SPRINGFIELD TRUCK COMPANY HOLDS SALES CONVENTION

The Kelly-Springfield Motor Truck Co., Springfield, Ohio, held a convention of sales representatives at the factory on Thursday, Friday, and Saturday, August 26, 27, and 28. On Thursday they all assembled for a group photograph and a trip through the factory. After luncheon, J. L. Geddes, president, and F. B. Hutchinson, sales manager, gave general talks, while L. P. Kalb, engineer, spoke on Kelly trucks from the engineering point of view, and Walter C. Guilder, production manager, spoke on Kelly trucks from the production point of view; after which a general discussion followed. On Friday, morning and afternoon sessions were held, and several excellent addresses made, followed by a get-together dinner at the Arcade Hotel. On Saturday an outing and picnic at Tecumseh Park proved very enjoyable.

DRIGGS-SEABURY UNDER NEW MANAGEMENT

Interests closely allied with the Bethlehem Steel Co. purchased control of the Driggs-Seabury Ordnance Corp., Sharon, Pa., and immediately announced the acceptance of large orders for war material, heavy trucks and ammunition. The name of the company has been changed to the Driggs-Seabury Ordnance Co., capitalized under Delaware laws at $4,000,000.

The officers are: John Stevenson, chairman of the Board, A. E. Borie, president, W. L. Wright, vice-president and general manager; H. H. Myers, treasurer, and S. B. Pratt, secretary.

HENRY FORD BUYS MORE LAND

Henry Ford will use the 214 acres of land he recently purchased as part of the big community town which is to be built around the proposed tractor plant on the River Rouge. There will be many acres not needed for the tractor plant, and this will be divided into lots 100x150 ft., allowing for a comfortable house with lawn and garden for the workers in the plant. Mr. Ford stated that every wooded portion would be saved as a playground or public park. When the big plant is ready for activities, the workmen will have a village to live in with every city convenience of the latest type. Within fifteen months it is expected that the first tractor will be placed on the market, and within a year and a half a new village of perhaps 10,000 or 15,000 will have sprung up as another of Detroit's suburbs.

CALIFORNIA FIRM TO BUILD TRUCKS

The Barker Motor Truck Co., 320 Grant Bldg., Los Angeles, Cal., is preparing to build and sell from Los Angeles, a half-ton truck, using six styles of bodies, including standard delivery, open, closed and hotel 'bus. The company expects to buy most of the parts in the East and would be pleased to receive proposals from manufacturers.

The CCJ has most advertisers because it gives them biggest returns

Personal Items

W. S. "Bill" Hughes has become chief engineer and production manager of the Falcon Motor Truck Co., Detroit, Mich.

R. S. Bryant, consulting engineer of the Standard Welding Co., has been appointed factory manager in charge of all manufacturing.

George C. Brainard, assistant sales manager of the Hydraulic Pressed Steel Co., Cleveland, Ohio, has been promoted to the position of chief engineer.

William H. DeVaney, formerly production engineer of the Interstate Foundry Co., Cleveland, has become president of the Hoosier Castings Co., Connersville, Ind.

O. P. Hand, formerly advertising manager of the Minneapolis Iron Store Co., has become director of publicity for the Burd High Compression Ring Co., Rockford, Ill.

Raymond M. Anderson, formerly chief engineer of the Stromberg Motor Devices Co., Chicago, is now research engineer of the J. I. Case Threshing Machine Co., Racine, Wis.

Rudolph Redlick, Jr., formerly foreman of the Velie Motor Vehicle Co., Moline, Ill., is now in charge of the service and installation department of the Stromberg Motor Devices Co., Chicago.

H. T. Woolson, formerly engineer of the Gas Engine & Power Co., Morris Heights, N. Y., has been appointed engineer of the commercial car department of the Packard Motor Car Co., Detroit.

Francis W. Davis, recently in the truck sales department of the Pierce-Arrow Motor Car Co., Buffalo, is now located permanently in London, Eng., representing the interests of the same company.

Edmund S. Roberts, formerly manager of the Kelly-Springfield Tire Co., New York City, is now sales manager of the truck tire department of the McGraw Tire & Rubber Co., East Palestine, Ohio.

E. V. Spencer, who has been manager of the sales promotion work of the Studebaker Corp., Detroit, at the factory, has been promoted to the position of assistant manager of the branch at Kansas City, Mo.

E. E. Havens, formerly with the Highland Body Co. as superintendent and designer, is now with the Cincinnati Panel Co., 8th Street and C. H. and B. R. R., Cincinnati, Ohio, in charge of the truck body department.

Eugene V. Barthmaier, formerly connected with Orin S. Wilson, Studebaker dealer in Philadelphia, has resigned to take territory for the exclusive sale of Studebakers in Norristown, Pa., and surrounding district. Temporary quarters have been established at 318 W. Main St.

S. T. Davis, Jr., President of the Locomobile Co. of America, Bridgeport, Conn., died on September 1st, from hemorrhage of the brain. He has been connected with the automobile industry since 1899. At the recent meeting of the N. A. A. M. resolutions of respect were passed. Mr. Davis was the first president of that association.

C. P. Cary, for the last 10 years with the motor truck industry, joined forces of the Garford Motor Truck Co., Lima, Ohio. He will become manager of the recently established factory branch at San Francisco, taking charge of the Garford interests on the Pacific Coast.

John I. Martin, who for a number of years has been connected with the sales force of the Federal Motor Truck Co., Detroit, has become affiliated with the Atterbury Motor Car Co., Buffalo, N. Y., as special representative for the present, and will devote his energies to the establishment of dealers.

Bertram Smith, well known in the storage battery field for the past fifteen years, has become manager of the Detroit office of the Edison Storage Battery Co. He has been with the Edison company about a year and a half, and before going with them was manager of the battery department of the Chicago branch of the United States Light and Heating Co.

G. Earl Porter, chief engineer of the J. C. Wilson Co., Detroit, returned from a trip through the East, taken in connection with experimental work for the Russel Axle Co. He is now engaged in completing a 2-ton model for the J. C. Wilson Co., and this will be marketed with a 1½-ton model which has been completed and thoroughly tested during the last two years.

Cliff Knoble has been appointed assistant advertising manager of the Hyatt Roller Bearing Co., Detroit. He has had several years' experience in publicity work, and was formerly connected with the advertising department of the National Cash Register Co., Dayton, Ohio. He will assist W. E. Biggers, advertising manager, in automobile dealer co-operative work as well as in general advertising.

H. W. Jamison, advertising manager of the American Sheet & Tin Plate Co., Pittsburgh, Pa., has been awarded a gold medal by the Panama-Pacific International Exposition Society for valuable services rendered in the installation of the large exhibits of the U. S. Steel Corp. and its subsidiary companies. When the steel corporation decided to make an extensive exhibit at the Fair, Mr. Jamison was appointed director of exhibits, and the results were so successful that the steel corporation and its subsidiaries were accorded the Grand Prize for the excellence of their exhibits and Mr. Jamison was awarded a gold medal in recognition of his services.

JOSEPH M. GILBERT, Vice President
Gibney Tire and Rubber Company

Recently elected vice president and director of sales of the Gibney Tire and Rubber Company, Philadelphia. He takes over a substantial stock interest, and in assuming his duties as an officer of the company, will direct the entire sales output of the company, under the advisory guide of President Gibney. His office will be in New York City, where the whole Gibney sales organization will have its center.

Kelly-Springfield Tire Co., for the first half of 1915, earned in excess of $700,000, compared with net of $1,215,144 for full year 1914. The directors say that $1,500,000 is a conservative estimate of net for the full year, allowing for bond interest and preferred dividends, this will leave approximately 25 per cent. for the common stock.

Factory News and Changes

Autocar Co., Ardmore, Pa., is receiving bids for the erection of a 5-story fire-proof plant.

Touraine Motor Car Co., will erect 6-story modern plant at 20th St. & Montgomery Ave., Philadelphia, Pa.

Rowe Motor Mfg. Co., East Downington, Pa., manufacturer of motor trucks, is adding 10,000 sq. ft. of floor space to its factory, by the addition of a brick building 70x200 ft.

Wilson, J. C., Company, 79-81 W. Adams Ave., Detroit, has moved its motor truck department to the plant at Warren Ave. & 15th St., where manufacturing will be carried on on a large scale.

Detroit Trailer Co., Inc., 90 E. Woodbridge St., Detroit, has moved to new large trailer factory just completed at 671-675 Atwater St., E., where its capacity will reach 30 trailers per day.

Russel Motor Axle Co., Detroit, has completed a large addition 60x192 ft. to the plant, which gives an additional floor space of 11,000 sq. ft. This new addition is being used entirely for assembling purposes.

Auto Engineering Co., successors to Fruchey Mfg. Co., 429 Bagg Street, Detroit, Mich., manufacturer of engine parts, tools, dies, jigs and special machinery, is running the plant 22 hours a day, 7 days a week, in order to catch up with orders.

New Process Gear Corp., Syracuse, N. Y., has purchased the plant of the Monarch Typewriter Co., adjoining its property. With this new addition, the company will be enabled to increase its capacity to 1250 differentials and 250 sets of transmission gears daily. It will be used for the job gear, spur gear and transmission gear departments.

Goodyear Tire & Rubber Co., Akron, Ohio, enlarging its factory by addition of 5 acres of working floor space. This will give the plant a total floor area of nearly 50 acres. The buildings will be ready, with machinery installed, by the beginning of the fiscal year, November 1st, and will require 2000 additional men, bringing the Goodyear working force to a total of 10,000.

Hartford Automobile Parts Co. is to move from Hartford to New Britain, Conn. The New Britain Chamber of Commerce will organize a building committee and it will erect a building for the company, which will lease the property for 5 years and buy it at the end of that time. It will be a 2-story factory 60x200 ft., and will be located at E. Ellis St., on the Berlin branch of the New York, New Haven & Hartford R. R.

Brown-Lipe & Chapin Co. has decided to equip the Lipe Model Works in Syracuse, N. Y., with special machinery for making the M. & S. differential gears exclusively. In addition to taking care of the demand from the manufacturers, this plant will also be used for making the M. & S. differential special type for Ford cars. However, the Ford replacement sales will continue to be handled by the M. & S. Gear Co., 1036 David Whitney Bldg., Detroit.

Yuster Axle Co., Cleveland, Ohio, has changed its name to the Columbia Axle Co., owing to the withdrawal of M. L. Yuster from the company, and for the reason that arrangements have been made with the Torbensen Gear & Axle Co., of Newark, N. J., whereby that company recently moved its entire plant to the Cleveland factory of the Columbia Axle Co. The joint product of both companies will hereafter be manufactured under one management.

The CCJ has most readers because it gives most information

Commercial Cars a Success in Military Work at Plattsburg

THE recent encampment of our captains of industry, at Plattsburg, N. Y., was primarily of interest to the automobile world on account of the practical use which was made of commercial cars for various purposes.

The motor train of fifteen trucks, ambulances and officers' cars, in single file, pulled into camp about 2 o'clock on the first afternoon. It had been on the road four days and a half, making camp each night. This was not, it must be admitted, quite up to schedule, but the commanding officers said they spent at least two days and a half repairing bridges and doing other road work which was required to get the heavy vehicles over detours which they were compelled to make to reach good camping grounds.

Captain Raynal C. Bolling, the organizer of the motor train, was in charge, assisted by Captain William J. Smedberg, Jr., 2d United States Cavalry, an expert on machine guns. The organization was without official title, but the officers called it the First Motor Machine Gun Company. The funds for equipping the cars were furnished by Judge Gary, of the United States Steel Corp.; George W. Perkins, J. P. Morgan, Brown Bros., Potter, Choate & Prentice and White, Weld & Co. Associated with Captain Bolling in the organizing of the company were George W. Hubbell, Jr., first lieutenant, and H. B. Clark, of White, Weld & Co., second lieutenant, all former members of Squadron A, National Guard.

The Autocar Co. furnished five cars for the outfit—an officers' reconnaissance car, a searchlight apparatus, carrying two lamps, which were used to light the camps; a motor ambulance and a military transportation car.

The International Motor Co. supplied two of its latest model trucks, with drivers; one of these was of 3½ tons capacity, and the other 1½ tons. Both carried machine guns.

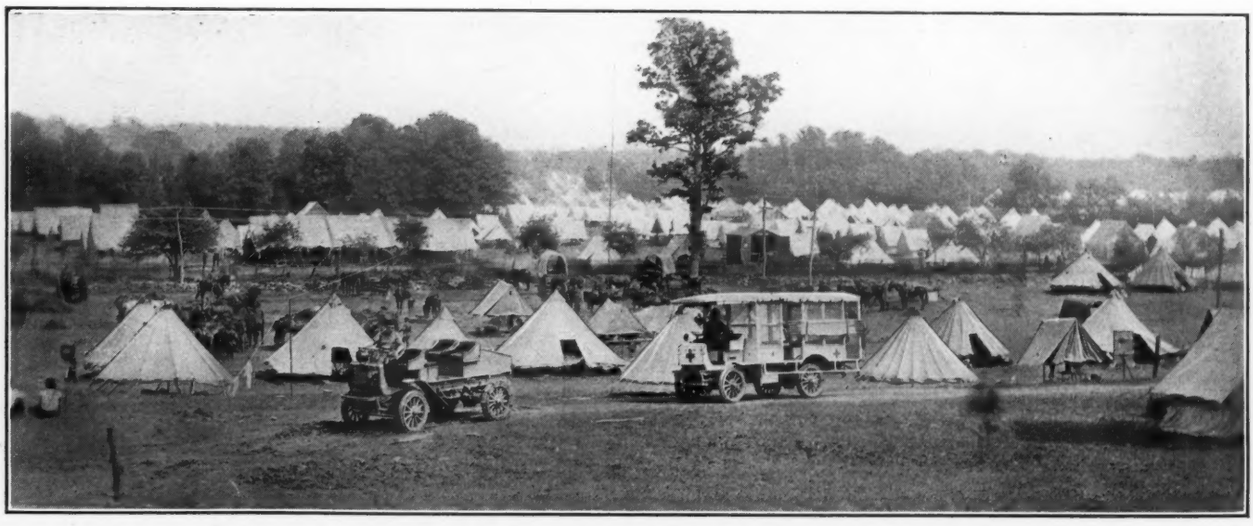
The Cadillac Co. contributed one fully armored car, with revolving gun turret, and one field ambulance. These cars recently crossed the continent on a tour which was made by the cadets of the Northwestern Military Academy, under the command of Colonel Davidson.

The Garford Co. supplied a field ambulance, with body of a French pattern, designed to carry six stretchers. This vehicle can also be used as a passenger car for carrying troops. The stretchers may be folded away and drop seats turned up to hold twelve passengers. This vehicle was in charge of H. F. Dobbins, of the Garford Co. who has been demonstrating the ambulance at various army posts throughout the country. It was used only once on the trip from New York to Plattsburg, on which occasion one of the enlisted men was carried for temporary treatment to a hospital in Saratoga.

The Cadillac Co. furnished an officers' car, and Carl H. Page, the New York Mitchell agent, supplied a Mitchell 6-16, which was used by Captains Bolling and Smedberg. Captain Bolling said this car gave remarkable service, and he did not recall that the driver had gone out of high speed but once or twice during the entire

Autocar Searchlight Car

During the encampment at Plattsburg, the power plant of this car was occasionally used to light the officers' headquarters



General View of the Camp at Plattsburg

The tents can be seen in the background and two of the Autocars are shown in the foreground

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

trip. Aside from carrying several officers, the car was loaded down with ammunition and baggage.

A Ford chassis, fitted with a transportation body and mounted with a machine gun, gave quite a practical demonstration of the value of the light car for army purposes. R. A. Derby, a plantation owner from Jackson Springs, N. C., which is in the Sand Hill country, accompanied by Ralph W. Page, of Aberdeen, N. C., entered the Ford as an experiment. Mr. Derby said that he is convinced the light car is the practical thing for army use and that upon his return to North Carolina, after the instruction camp is closed, he will organize a company of one hundred Ford cars, and it is his intention to mount them with machine guns and drive from North Carolina to the encampment next year. He thinks this idea should be taken up by Ford owners in all parts of the country, and next year he says we should have 700,000 Fords ready for use against the invader.

The Buick Co. supplied a transportation wagon, mounted with a Colt machine gun.

There was also a Cadillac field hospital, which attracted considerable attention.

The Simplex Co. sent a transportation wagon, mounted with a machine gun.

There was one Mack 1-ton truck, of 30 h.p., fitted with steel plates and designed as a transportation wagon, to be used in emergency for defensive purposes.

A Mack 3½-ton truck, armored with steel plates, carried a machine gun and towed a gun carriage and field piece.

A Saurer 5-ton truck was heavily loaded with ammunition and men and towed a gun carriage and field piece.

Motorcycles were employed by the noncommissioned officers of the three divisions comprising the train. These were found useful in scouting ahead for roads, carrying messages and reports and as mail carriers.

The Autocar Co. searchlight wagon furnished ample light for the entire camp at night. In fact, the men said they could read letters and newspapers or shave themselves 200 ft. away from either one of the lights.

The electrical apparatus of this equipment is mounted on a special body on a standard Autocar chassis. The body is designed so as to furnish protection for the power plant, and to support the four reels of flexible cable; and the spring mounted tracks on which the two searchlight hand trucks rest. These springs are quite essential eliminating road shocks from the delicate mechanism of the lamps.

The power plant consists of a standard Autocar gasoline engine, 4¼- by 4½-in. cylinders, coupled direct to a seven-kilowatt Westinghouse direct current generator. This generator is designed to run at 1200 r.p.m., at which speed it gives 123 volts and delivers 56 amperes. The motor is equipped with a Pierce fly ball governor, regulating the speed within very close limits.

The engine driving this generator is supplied with its own gasoline tank, and also an independent radiator kept cool by a high speed fan.

The two hand trucks which carry the searchlights and reels of flexible wire are constructed entirely of steel and aluminum, and have each two wire wheels equipped with 28x3 pneumatic tires. These trucks are light in weight and rigid in construction, and so designed that they have large road clearance beneath the light to enable them to be operated in very rough country. Each light carries 1350 ft. of cable, divided into two lengths of 675 ft. each, so that each lamp can be operated independently of the other at a distance of one-quarter mile from the generating plant. By means of specially designed attachment plugs and reel arrangement, the light can be operated at any distance within the limits of the cable from the power plant without unreeling all of the wire to get at the inner end. The inner ends are arranged to pass through the heads of the drums, so that the attachment may be readily made.

Each searchlight is 14 in. in diameter and has an arc of 5000 candle power, and is effective up to 1½ miles on a clear night. To get the maximum value of the lamp, the observer should stand at some distance to one side, and by means of a field telephone control the operation of the light.

The only thing about the motor train which seemed to be impractical was the method of towing steel tired, high wheeled gun carriages and field pieces behind rubber tired wagons which were designed to travel at the rate of 20 m.p.h. It was difficult for the men on these gun carriages to hold on at a speed of 10 m.p.h. The gun swayed constantly from one side of the road to the other, and the terriffic jolting would put even a cast-iron soldier out of business in about one week of travel. If it is necessary to tow field pieces in this manner, they must be provided with rubber tired wheels or placed upon a rubber tired carrier, which will stand the speed and eliminate the vibration which would put both the men and the guns out of commission.

Commercial Cars at Plattsburg

This view shows three of the Autocars. The one to the left is the officers' car; the center one is an ambulance, and the one to the right is the searchlight car

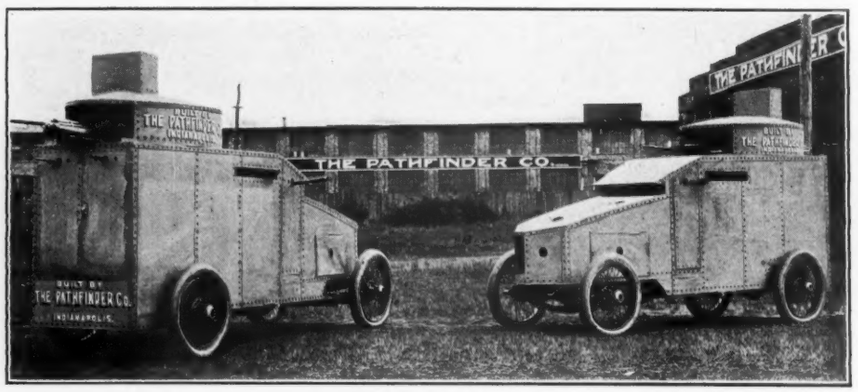
THE PATHFINDER ARMORED CAR

W. E. Stalnaker, vice-president and director of sales of the Pathfinder Co., Indianapolis, Ind., manufacturers of Single Six and Twin Six cars, is very much interested in the "War in Indiana" which took place in Indianapolis on September 6th.

Mr. Stalnaker has gone to a great deal of trouble to get two armored cars built on the standard Pathfinder chassis. This car has made a sensation in Indianapolis because of the construction of the armored body and noiseless motor. The armored body is of boiler plate construction, following the United States and German Government design.

The car is finished in United States Government standard Battleship Gray, so that the enemy can not discern the car from a distance. It is also equipped with a barbwire fence nipper. It is equipped with Kelly-Springfield 35x4½-in. tires. When this car was tested it was run over

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?



Two Pathfinder Armored Cars

Fitted with regular Pathfinder chasses and equipped with full line of firearms and barbed-wire-fence nipper

plowed fields, through the ditches, cut wire fences and all kinds of roust-about work.

An attempt has been made to use the cars in the same way as they are used in the great European War.

These cars are equipped with colts, special gatling gun, which is the standard United States Army quick action gun, which fires one thousand times a minute. A turret is built on top of the car to protect it from airship bombs, etc. Four men are used to operate the gun, one to sight the enemy, another to turn the crank, and two to load the gun. The car also carries a captain and a driver. The driver sits in the usual position in the car but is hidden and fully protected.

"I am mighty well pleased with Engineer Feilcke's new Pathfinder armored car," states Mr. Stalnaker. "I am very enthusiastic over the big part played by the motor car in the great European War, and feel that America should give some time and thought in aiding our government in supplying motor cars that would be of great service if the enemy should ever attempt to attack America."

THE BATTERY SERVICE SYSTEM*

THE Battery Service System of the General Vehicle Co. is a system with which a user purchases a vehicle without the battery, thereby materially reducing his investment; and is relieved from the burden and expense of purchasing and maintaining the batteries therefor, as well as obtaining the continuous use of storage battery equipment, paying for the same on the basis of the service rendered."

The General Vehicle Co., Inc., realizing the inertia which has attended the introduction and successful application of the electric truck in a great many of our cities, has through the Battery Service System made it easier for the business man to buy the truck; made it easier for the Central Station Manager, through the centralization of batteries to co-operate with the merchant and the vehicle manufacturer, at a profit to himself. In other words, it is a case of one vehicle, one battery and one garage, operating at minimum expense and maximum profit to all three interests.

Electric vehicles have not been as freely purchased in the past as could be desired for four reasons:

First: High initial cost of vehicle. Second: Uncertainty in layman's mind as to efficiency, life of battery and its care. Third: Limited mileage on one charge. Fourth: Uncertainty as to actual cost of battery operation.

With the four objections referred to removed, the use of electric vehicles will be rapidly increased, and a large and important off-peak load obtained by Central Stations.

Under the Battery Service System of the General Vehicle Co. the vehicle is purchased without the battery, reducing the purchaser's initial investment from 20 per cent. to 38 per cent.—or all the way from $300 to $2400 per vehicle. Relieved from the ownership and care of the battery, the user may concern himself only with the operation of the vehicle. As the system provides for the exchange of batteries as often during the day as required, mileage limitations are removed, encouraging the user to cover longer routes thus reducing his cost per ton or other unit. Furthermore, as the user buys *miles* rather than current at a standard scale of charges, he can usually pre-determine his cost per month, per day or per delivery. Where he knows his horse costs, he can by comparison know in advance what his economies will be.

Summed up, the system reduces the operation of electric vehicles to the simplest possible form, and means to truck users:

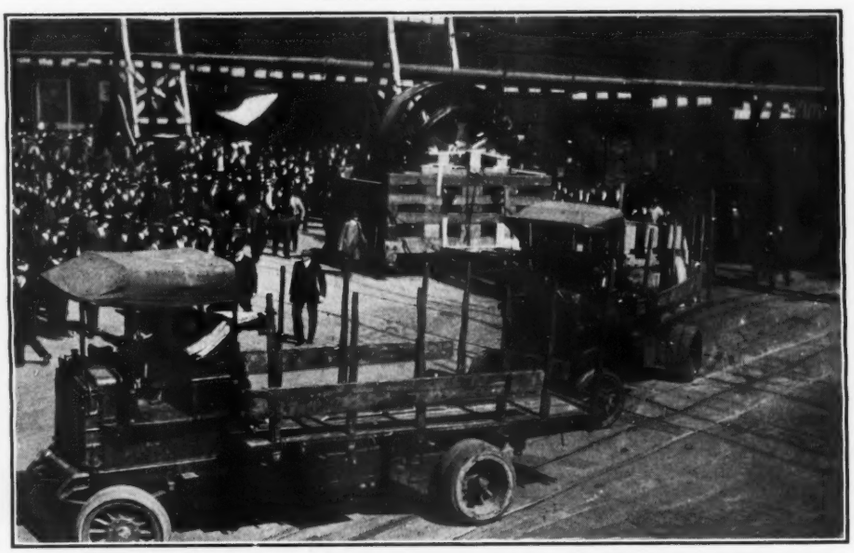
A substantial reduction in truck investment; no charging apparatus or garage investment; unlimited mileage and continuous service from trucks; busy season difficulties and bad roads overcome; relief from care of batteries, and a reduction of all items of battery cost, including current, to a definite basis of miles travelled per month.

(The inspection of vehicles assists the user and prevents small troubles becoming the source of delays in service.)

Seven cities, Boston, Hartford, Worcester, Fall River, Baltimore, Spokane and San Francisco, have already adopted the Battery Service System. The Central Stations in these cities are all co-operating and vehicles are now operating under the system in Hartford, Boston and Spokane. The General Vehicle Co. waited two years after the first installation of the system before definitely adopting it and another year before recommending it to the public. The need has produced the remedy and as the idea of "Fool Proof Trucking" appeals strongly to business men, we confidently look forward to more rapid progress in the Electric commercial car field as a result of this latest enterprise of the leader in that field.

*From an article in the General Vehicle Co.'s Central Station Bulletin.

Motor Truck Club of America, Inc., held a regular monthly meeting on Wednesday evening, August 10th, at 8 p.m., in the assembly rooms of the Automobile Club of America, 247 W. 54th Street, New York



Hauling a Thirty-five Ton Armature by Motor Truck and Trailer

One of the giant armatures which was hauled from Thirtieth Street and North River, to the new station of the New York Edison Company at Thirty-ninth Street, between Broadway and Sixth Avenue. The only difficulty encountered was when traffic held up the truck on asphalt pavements, when the broad wheels of the trailer sunk into the street as though it was soft mud. When this happened the wheels were jacked up and planks laid beneath them. Richard Doughty received the contract for this job.

The CCJ leads in circulation, advertising and prestige

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HIGH COST AND SCARCITY OF GOOD HORSES WILL BOOST TRUCK SALES AFTER THE WAR

ALTHOUGH, as we have pointed out, the number of horses and mules sold and transported to Europe is but a small proportion of the total number in this country, not over one and one-half per cent., still there are good reasons why this importation will seriously affect not only the price of horses but the numbers which are ready for heavy duty within the next few years. Furthermore, this importation will not cease with the war, for good horses will be in demand for both city and country use abroad after the war is over.

Unfortunately for the horse supply, mares have been freely exported, so that although the number which has already gone out of the country is not excessive as compared to the twenty-five or twenty-six million horses and mules in the country, still it must be remembered that these are the pick and that the decrease in the number of high grade mares will make itself felt very markedly within the next few years.

Really good horses for commercial purposes were decreasing rapidly and the price increasing even before the European struggle. At its close, not only this country but Europe will feel the lack of good horses. Even now a fine pair of matched draft animals will bring from $600 to $1000. Commercial cars will in consequence be in greater demand. Every indication points to increased truck business.

ENGLAND FEELS COMPETITION OF AMERICAN TRUCK MANUFACTURERS

THE establishment of American trucks in the English market is evidently to be one of the results of the European struggle. Already British manufacturers of trucks and accessories are feeling the inroads on their trade caused by the wholesale introduction of the American product, due to the war. That this is true can be clearly read from the nature of the advertisements which are appearing in foreign trade papers. In numerous instances English manufacturers call attention to what it is costing British taxpayers on account of the thousands of imported cars now being sold in Great Britain and demand that purchasers be patriotic and that they do not buy American accessories or trucks.

These advertisements are but an indication of the fact that British manufacturers are feeling keenly the sale of so many American made trucks in their own market. They indicate also that the British manufacturers themselves believe that the purchase of so many American trucks is not necessary, and that they are able to supply more than are being purchased.

If this is the true state of affairs and British manufacturers are able to supply more than are being purchased and used, it is a clear indication that American goods are being received very favorably by the British public.

These conditions would lead one to predict that if American manufacturers follow up the opening which the war in Europe has produced, there should be a splendid market for American trucks after Europe has settled its difficulties, and merchants are again pursuing the arts of peace.

Steel and Rubber Markets

August Good Month for Steel Mills

The month of August proved one of the best ever for the steel industry. The volume of business taken for the first eight months of the year totals 1,709,000 tons, as against a total of 600,000 tons taken in the period of 1914, or a gain of over 140 per cent. Marked tendencies toward higher prices have strengthened the positions of the mills. Car buying during August totaled about 7450 cars, making the total for the first eight months of the year 75,450 cars, as against bookings of only 21,000 cars during the same period last year. Quotations on September 8th were:

STEEL PRODUCTS PRICES

Bessemer billets, per ton, mill	22 00	a23 50
Open hearth, per ton, mill	23 50	a24 00
Sheet bars, per ton	24 00	a24 50
Forging billets, per ton, mill	29 00	a30 00
Steel bars, soft base, half ex-tidewater	1 44	a 1 46

The above prices are at tidewater, in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2 per ton additional is charged, and less than 1000 lbs., $8 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots are $2 per ton higher.

Gage—	Black.	Galvanized.	Gage—	Black.	Galvanized.
Nos. 10 and 11	1 55	2 60a2 75	Nos. 15 and 16	1 65	2 80a2 95
No. 12	1 55	2 70a2 85	Nos. 17 to 21	1 70	2 95a3 10
Nos. 13 and 14	1 60	2 70a2 85	Nos. 22 and 24	1 75	3 15a3 30

IRON AND STEEL AT PITTSBURGH

Bessemer iron, Valley furnace	15 50	a16 20
Bessemer steel, f. o. b. Pittsburgh	23 00	a23 50
Skelp, grooved steel	1 30	a 1 35
Sheared steel skelp	1 35	a 1 40
Skelp, grooved iron	1 70	a 1 75
Sheared iron skelp	1 80	a 1 85
Ferro-manganese (80 per cent.), seaboard	100 00	a ....
Steel, melting scrap	14 00	a14 50
Steel bars	1 35	a ....
Black sheets, 28-gage	1 90	a 1 95
Galvanized sheets, 28-gage	3 60	a 3 75
Blue annealed, 10-gage	1 50	a 1 65
Tank plates, ¾ and heavier	1 30	a ....

The CCJ has most advertisers because it gives them biggest returns

Rubber Market Quiet

With purchases limited to current needs, manufacturers have evinced little interest in the rubber market of late, and dealings among traders have been quiet. Prices have been slightly reduced. New York quotations on September 8th were:

Para—		Islands, coarse	27 a....
Up-river, fine	56½a57	Caucho ball, upper	43 a43½
Up-river, coarse	42½a43	Caucho ball, lower	41 a41½
Islands, fine	50 a....	Cameta	29½a....

Ceylon—		Esmeralda	39 a39½
First latex pale crepe	59 a....	Mexican scrap	38½a39
Smoked sheets	58½a59	Gayule	30 a31
Sheets and biscuits	58½a59	Balata, sheet	54 a56
Centrals—		Balata, block	39 a40
Corinto	39½a40	**African—**	
		Massai, red	52½a53

DOMESTIC SCRAP RUBBER

Tires—			
Automobile	4¾	a	
Bicycle, pneumatic	3	a 3¼	
Wagons and carriages, solid	4½	a	
Red	7	a 8	
Inner tubes, No. 1	25	a 26	
Inner tubes, No. 2	11½	a 12	

BOSTON ELECTRIC MEN DIVIDED ON BATTERY SERVICE PLAN

The establishment of a battery service system in Boston somewhat after the plan already in use in Hartford, Conn., is creating dissension. The Boston Edison Co., Electric Storage Battery Co. and the General Vehicle Co. co-operated to make it possible for purchasers to buy electric trucks without batteries, and have battery service supplied at a fixed rate, with interchangeable batteries.

As only these three companies had finally co-operated to make the scheme possible, other makers and vehicle charging manufacturers as represented by a committee of nine are protesting that the system prevents central stations from assisting all vehicle users. This committee of nine is actively at work to convince the central station people that it is not best to put the battery service plan alone into operation. As a part of this propaganda the committee of nine has sent an open letter to the central stations of Boston and vicinity, extracts of which follow.

Letter Sent by the Undersigned to Central Stations

The earnings to be derived from the extensive use of electric vehicles make it a matter of importance to the central stations to use their influence in the right way.

Recollect that electric vehicles can be operated with economy either by the use of a battery exchange system or individual charging boards, and here again the better of the two methods must be determined by an analysis of the prevailing or expected conditions. It is also important to remember that with the standardization of both of these methods of charging, the central station is in a position to meet every application with its proper solution, resulting in a larger profit than if either method is advocated to the complete or partial exclusion of the other.

It is obvious that the slowness of the public in general to adopt the electric truck in any fair proportion to its advantages is due mainly to popular impression that anything electrical is actuated by some mysterious power capable of control, and in the cases where storage batteries are concerned, of replenishment only when handled by men specially versed in the art.

Let the public served by you realize that you are using and can honestly recommend electric vehicles. Establish two general methods of charging; first, offer a battery exchange plan, open on the equal terms required of a public service corporation to any applicant; second, by means of individual charging boards owned and operated by your customer. Also establish a bureau of information for present and future users of electric vehicles in your territory, from which bureau information helpful to the trade should be issued to it simultaneously and with exact impartiality.

Why not establish and encourage as many different methods of charging as will serve electric vehicle users to their profit and satisfaction, thus increasing the permanent revenue of the central station and enabling it to build up its "off-peak" load at a fraction of the effort expended at present to fill up the valleys in the load curve? And what is there new, novel or exacting in either of the general schemes of charging proposed under this plan? The battery exchange plan is old; it is now available with equal facility for any make of truck, owing to the use of universal battery compartments by all the leading makers of vehicles and standard battery dimensions have long ago been realized within easy working limits. This plan of charging presents no difficulties to the central station and its adoption as a stimulus to the industry will be beneficial indeed, especially as public service officials will realize, without the necessity of illustrative examples, the prime importance of preventing the public from gaining the impression that the central station can or will favor special interests. The handicaps of individual charging have been removed with the perfection of the batteries and introduction of simpler and fool-proof control equipment. Such individual charging installations should always be advised by the central station when prevailing conditions make it possible for the user to avoid the overheads of the battery exchange or mileage plan of service. And to follow such a plan means more revenue for the central station, resulting from the sale of current, minus extras; *i. e.*, gives you the maximum possible profit, and automatically brings the user nearer to the economic ideal. Endorsement of the charging at home plan will offset the inference created by the establishment of a universal battery exchange, that electric vehicles are still in the infantile stage and require trained nurses, and thus make it possible for the central station to furnish this double service without the possibility of inadvertently destroying the paramount simplicity argument of the electric vehicle salesmen.

And finally, the wisdom of bureaus of information maintained by central stations to capitalize their local prestige is unquestioned to-day. The civic trend of modern times makes it as foolish as it is futile to attempt to develop any great instrument or institution of public service along the lines which savor of favoritism or monopoly.

Committee

Floyd T. Taylor,
District Sales Manager,
The Cutler-Hammer Mfg. Co.
R. B. Daggett,
Manager New England District,
Commercial Truck Co. of America.
P. E. Kelley,
Manager Boston Office,
Philadelphia Storage Battery Co.
George W. Holden,
New England Manager,
Edison Storage Battery Co.
W. E. Haseltine,
Assistant General Manager,
Holtzer-Cabot Electric Company.
John A. White,
New England Manager,
United States Light & Heating Co.
M. O. White,
Boston Manager,
Ohio Electric and Ward Electric Truck.
J. W. Emery,
New England Manager,
Walker Vehicle Co.
M. E. Brackett,
Boston Branch Manager,
General Motors Truck Co.

BUDLONG LEAVES PAKARD

Milton J. Budlong, president of the Packard Motor Car Cos. of New York City, Philadelphia and Chicago, has resigned to become vice-president of the importing and exporting firm of Gaston, Williams & Wigmore, Inc., 140 Broadway, New York City.

Upon Mr. Budlong's leaving, E. B. Jackson, who, under Mr. Budlong's supervision, has been manager of the Packard Motor Car Co., of Philadelphia, will be brought to the metropolis and made president of the Packard Motor Car Co., of New York City. He also will have general supervision over the management of the Packard Motor Car Co. of Philadelphia.

H. M. Allison, who for many years has been manager of the Packard Motor Car Co., of Chicago, will be promoted to president of that company.

Old Reliable Motor Truck Co., Chicago, increased capital stock from $100,000 to $200,000.

Elmira Commercial Motor Car Co., Elmira, N. Y., has been incorporated for $500,000 for the purpose of manufacturing a 500-lb. machine to sell for $300.

Lombard Auto Tractor-Truck Corp., New York City, has been incorporated with a capital stock of $25,000 to manufacture autos, etc. Jas S. Parron, 320 W. 77th St., is one of the incorporators.

Elmira Commercial Motor Car Co., Elmira, N. Y., has been incorporated with a capitalization of $500,000 and will manufacture trucks, etc. Albert Von Beauliet, Henry Bush and George Gebbie are the directors.

Detroit Steel Products Co. will erect a new building which will add approximately 15,000 sq. ft. of floor space, to accommodate the increase in the production of the automobile springs department. This will be the third addition to this department within a year.

The report of the Gibney Tire & Rubber Co., for the year ending August 1st, shows an increase in business of several hundred per cent., and additions to the production facilities, just completed, has increased the output fivefold within the few months. A dividend of 60 per cent. has been declared.

The CCJ has most readers because it gives most information

American Truck Manufacturers and European Trade

By HENRY STURMEY

[Editor's Note.—This article by the well-known writer, Henry Sturmey, gives the English view of American methods of doing business, and contains valuable suggestions to our makers as to what course is necessary to secure British business.]

THERE is no doubt that Europe, and particularly Great Britain, presents a wonderful field for American trade in automobiles at the present time, and not a few producers your side are doing good business here. Since the war broke out, through advising several firms here, I have been brought in touch with a great many United States manufacturers, both of cars, components and material, and I have been much struck by the utter failure of many of them to appreciate and understand conditions which pertain here at the present time; or, indeed in some cases, which way to handle foreign business at all.

American Makers Not Well Represented

In the first place—and this was particularly the case during the first few months of the war—American producers of cars, and particularly of trucks, gave terms to every person who wrote them, and the consequence was that, as scores of people here, many of them with no standing and with no knowledge of the trade whatever, sought to obtain War Office contracts for American trucks, the same outfits were being offered to the authorities by—as one producer told me afterwards—fifty or sixty people. Every Tom, Dick and Harry rushed in to "make a bit" "on the nod" and, not being able to differentiate "t'other from which," the War Office declined to do business with either, and those firms fell to the ground, so far as any government business was concerned, and there was little else going. In a sense perhaps, American firms are not altogether to be blamed, for, knowing nothing of either of the many applications they received for their representation, they were in a quandary and so settled the matter by saying, "The man who gets the business gets the money." Such a policy, it is needless to say, offered little inducement to serious and capable men to work in their interests, and so they were for the most part represented by little better than adventurers. Other houses, realizing the difficulty from a business point of view, stood out for the purchase of a sample vehicle and then gave their representation to the first person or firm prepared to speculate to this extent. But this was almost as bad, for, conditions at the time being such, that there was no private trade doing at all, the government's orders presented the only opportunity for business. Moreover, the average American truck being unsuited, without alteration, for our home trade, experienced and representative men in the industry, knowing the difficulty and great uncertainty about receiving government orders at all, declined to invest in what might prove a white elephant on their hands, and so the representation often went to sanguine speculators, knowing nothing whatever of the business, who, not unnaturally, failed utterly to interest any of the War Offices in their propositions. To give an example, I may mention that one of these gentlemen got over a 3½-ton model from a well known producer and instead of offering it at its English equivalent of 3 tons, finding the War Offices at this time contemplating the purchase of 5-ton (English) outfits, calmly put it forward as a 5-ton vehicle—which would be 6-ton American! Of course it was not accepted and a few months later that party, finding his efforts useless, was offering that truck for sale—still as a 5-ton vehicle—for anything it would fetch!

Successful Firms Had Agencies Already Established

The firms who were successful in getting in on the early wave of war orders were, for the most part, those who either had representatives and agencies already established in Europe, who fixed up with good men knowing the trade here and placed a truck and demonstration driver at their service early in the day, or who sent over their own representative, with a truck, to handle the business for them. Representatives, either appointed or dispatched, who attempted to do business on catalogue only, met with little or no success, as few, if any, of the purchasing departments of either of the belligerent governments would purchase without seeing and putting to a very searching test the trucks they were asked to buy, and I know of more than one case when good business would almost certainly have been secured had the makers acceded to the request of the parties who were offering their trucks here and sent over a machine. In these cases, the firms in question, who were large and well-known houses in the States, took the attitude that their machines were so well known that such an expense was wholly unnecessary, oblivious of the fact that, however well known they might have been in America, their names even were quite unknown on this side the Atlantic. When it began to dawn on producers that large contracts were being given out over here, quite a number of them sent over representatives, both to London and Paris—generally without samples—but they were most of them too late. The difficulty of getting any truck or car, not already on the list of approved vehicles, accepted by the different War Departments, is now very great, as the authorities are averse to adding to the number of models employed, owing to the difficulty of dealing with spare parts and replacements.

About Agents Handling Too Many Cars

Whilst, as I have said, many firms lost their opportunity by failing to make arrangements with responsible and capable representatives in the first place, others, on the other hand, have made the mistake of fixing up a sole agency arrangement with people already handling competing makes, who effectively "bottle" their competition. Thus, one firm here, to my knowledge, "represents" six different makes of truck, whilst another has the sole representation of no less than a dozen—all of them competing makes—and so far as I have been able to ascertain, only one in the former case and three in the latter are being pushed, an arrangement under which some of the firms so represented are bound to go to the wall.

Domestic Requirements Not Met by American Firms

Whatever attempt there may be to secure War Office contracts from the different belligerent governments by those entrusted with the representation of American interests, the business in regard to meeting our domestic requirements is, for the most part, very poorly done. Although I believe that close on forty builders of trucks in the United States have now given their representation to people here, not more than about a dozen are efficiently represented and no publicity whatever is being given to the interests of the rest. They might well have no representatives at all. Trucks won't sell themselves, here or in America, and buyers here won't buy trucks the names of which they have never heard, however pressed they may be. Buyers here are, in many cases, very hard pressed, as almost the whole of the home output is being absorbed by the War Department, whilst the output of the remainder is being largely curtailed on account of the difficulty of procuring material and by reason of the fact that a large portion of the plant, as well as of the men in the different factories, is being taken over for munition work.

European Prices of American Truck High

With freights adding in some cases close on $500 to the landed cost here, the prices of most American trucks, especially those of three tons and upwards, are prohibitive, and with these I look for very little continuity of business after the war.

Right-Hand Steering Essential

The makes which are doing the best business here at the present time are those 2-ton outfits which can be sold retail at about the same prices as those of home make and which are being sold under different names by the parties who are handling them here, thus making them appear at first sight to be home produced vehicles. In these cases the builders have been at some pains to carry out some modifications in design to suit them for conditions here; such, for instance, as in shifting the steering from the left-hand side of the car to the right, in which particular, I may mention, I have found in the majority of cases that truck producers your side absolutely refuse to fall into the wishes in this respect of those who are desirous of handling their product here, although right-hand steering

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

is an absolute essential if ordinary business is to be done at all. In this respect, the makers of touring cars are very much more far-seeing, as all who are doing business here, without exception, have long recognized the necessity. It may be mentioned that, with one or probably two exceptions, all the United States makers of touring cars—and there are a good many of them—who are doing good business in this country have established their own depots, with their own representatives in charge; these being for the most part Englishmen well versed by long experience in the trade. If truck makers want to do business here, they must follow the same policy and either establish their own branches or appoint representatives here who know their business and back them up to the fullest degree.

War Office Requires Securities

Reverting once more to the question of war contracts, I may point out what is not generally known that, with the exception of the British Government, all the War Office buying departments in Europe now require, in the event of contracts being placed, that the contracting firm shall deposit with the national bank of the country contracting securities, or similarly unassailable guarantees, to the value of 25 per cent. of the contract, as a forfeitable guarantee that the contract entered into will be carried out; thus, for example, if a firm secures a contract for, let us say, 400 trucks at $2500, the value of the contract amounting to $1,000,000, instead of, as would be the case with a contract with a business firm, the producers receiving a substantial deposit on account of the contract, they would have themselves to put up some $250,000, or securities or guarantees to that amount, a requirement which naturally reduces the number of firms able to deal with such contracts to somewhat meager dimensions. It may be explained that a reason which is given for this very onerous requirement is that, during the early days of the war, when there was a big rush on and contracts were given out rather freely, several enterprising but impecunious and unscrupulous persons, having got terms and catalogues from truck builders, both here and on your side, entered into contracts with the governments without any intention whatever of fulfilling them, but promptly sold, or attempted to sell, their contracts to speculators, for a "quick deal" cash consideration, and the purchasing governments did not get deliveries of the trucks they had contracted to buy, which, under the stress of war conditions, was a serious matter, and the above regulation is now de riguer in all future transactions. In addition to which, they decline to discuss business at all with firms of persons professing to represent producing houses, unless they are able to produce documentary authorization to act on behalf of the firms whose goods they are offering.

In addition to the business in complete trucks and cars for the supply of the belligerent armies, the war has induced a considerable and growing demand in this country for manufacturing supplies, such as raw material, drop forgings and various component parts, owing to the fact that the labor supply has been depleted by men joining the colors and to the demands of the Munitions Department, which is commandeering, not only men but machinery, so that many of our motor car constructors are finding it difficult to procure supplies from their usual sources and in many cases the aid which America has been able to afford has served to bridge over the difficulty. This difficulty would be greater than it is but for the fact that the government undertakes to assure the material supplies of all firms who are building cars or trucks to its requirement, and now so many firms in the motor line, who are not building government cars, are devoting all their manufacturing facilities to the production of shells and other such like war material, that comparatively few cars of any kind are being turned out for private users. Still, as I have said, some trade has been done and the demand will be a growing one, as manufacturers get over their mistrust of American productions, or the shoe pinches harder.

In so far as this class of trade is concerned, no American producer that I am aware of has, as yet, established his own branch here, but for the most part the business is being handled by English firms and the men who act as their representatives, and the arrangement has proved satisfactory in working. In a few cases only are such propositions handled by buying agents, or, as I believe you term them, "jobbers." In some cases the parties handling the goods here have rock-bottom prices quoted to them and make their own prices to the purchaser, ordering supplies as required; but by far the best class of business is done by houses who act as direct representatives of the firms whose goods they are handling. These work upon a small commission upon net business done, look after the producer's interests generally and sell goods on his account at best factory prices, goods being shipped direct from factory to customer, the latter paying net transportation charges. It is usual for all quotations to be f.o.b. American port, which eliminates any uncertainty as to inland charges on your side, whilst the representative, by keeping in touch with the shipping companies, is able to give closely approximate figures for landed cost. This arrangement assures the customer buying at the cheapest rate, as he is not charged excessive profits, but buys at factory prices and pays only the actual transportation costs, instead of added interest and profit upon them, which the jobber usually puts on.

Of course, the best way to do business here is to establish a branch, with its own special staff. But that is an expensive matter, and I doubt if it would pay a material or component house at the present time, or even after the war. If that were done, the firm doing it would have to carry samples of all its line and stock of the most popular and inaugurate a proper advertising campaign. An English representative here saves all the cost of sending a man across, saves his salary and all the expense of running an office and staff and gets paid on results only. No business no pay. And yet manufacturers won't back him up and put him in a position to do business properly. The firms who are doing the best business this side placed their business in the hands of representatives who know the trade thoroughly from A to Z, and they have not only furnished them with all the literature required—in some cases specially printed with English prices, etc., but have provided them with samples of the goods dealt with and have also undertaken a moderate amount of advertising in the principal trade papers. Such a policy is sure of success, if goods and prices are right and prompt fulfillment of orders can be given; in which latter connection I may say that one or two firms, in addition to the help recorded above, have also arranged to carry a small stock to fill urgent needs. The importance of having samples to work with is great, particularly at the present time, because, with only weekly mails, it takes about a month to exchange correspondence and about a couple of months to get deliveries through. Most firms are within sight of wanting the goods before they think of ordering. It will thus be seen how very short-sighted a policy it is to expect to get substantial business on literature alone, more especially when it is pointed out that the average British manufacturer has a preconceived idea that American productions are somewhat of third grade quality and is at first very chary of doing anything with them at all, and it is only the pressure of war conditions that is forcing his hand at the present time. Some manufacturers here, indeed, decline to avail themselves at all of any help from your side the Atlantic and prefer to let their private trade in cars go altogether whilst the war lasts. Munitions work and other war contracts are, of course, keeping their factories very fully employed and they are figuring on their reputations keeping their connection together after the war.

Trade Good in England

In regard to terms of payment for goods supplied, I find very few United States producers of components, and none of cars, are prepared to do business on the same terms as home producers do. It may be pointed out that one of the most potent factors in the capture of our—and your—trade, prior to the war, by the Germans, was that they invariably fell in with the "custom of the country," in regard to credits and frequently scored over their native competitors by "going one better" in this respect. Of course, we are at war over here, but firms your side do not, I fancy, grasp the real position with us. Trade is not bad. It is more than good and in all the mechanical engineering industries here production is the difficulty, and there is no shortage of either business or money; which latter is, in these trades, particularly plentiful.

Little Chance of Bad Accounts

There is little chance of bad accounts, and practically none with a good representative in charge of interests here; whilst, as regards the danger to the goods themselves in transit, by reason of Germany's submarine warfare, the value of this factor is best shown by the war-risk rate of insurance, which still stands at 1 per cent., the payment of which—by the customer—absolutely eliminates *that* risk entirely from consideration. Yet many firms your side decline to do business at all with Europe under present conditions! Some flatly refuse, and a really astonishing number fail

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

to reply at all to communications enquiring for terms and particulars of their product with a view to business! Others put forward impossible terms, as, where one well-known house wrote: "We don't know that we would care to supply at all, and, if we do business under present circumstances with any firm your side, we should require a deposit of at least 50 per cent. when the order is placed, and the balance before the goods leave our factory!" Needless to say they were not troubled further.

Credit Terms, C.O.D. Shipments, Etc.

If supplying customers in the home markets, provided their commercial standing were satisfactory, producers on either side the Atlantic would supply on 30-, 60-, and in some case 90-day terms. Yet, when they are asked to do overseas business, they stipulate for payment in full before the goods leave the factory, or at best in exchange for shipping documents at point of shipment. Seeing that delivery, under present conditions, takes from six to eight weeks, this means that the customer, instead of getting the sixty-day terms he would get when buying from a home producer, not only gets no credit at all, but pays for the goods sixty days before he gets them—a 120-day disadvantage when dealing with the American firm. In one or two cases, terms are arranged on the basis of payment against shipment by sight draft payable in thirty days from date of shipment, customer paying the rate of exchange and this is a little better. The American producer really sells his papers to a bank on the security of the goods, the bank collecting in thirty days both cash and charges; but the customer still pays before he gets the goods and this is what all buyers here, without exception, kick at. They do not mind paying for the goods when they get them, but they object to paying for them before they get them, and hence, if credit terms here cannot be given, C.O.D. terms, by sight draft against documents should be given. Yet I only know of one or two houses your side who are willing to do business on this basis; although, as I have already shown, if proper precautions are taken and full insurances effected, it is perfectly safe and, so far as the producer is concerned, it practically works out as a sixty-day credit, as he gets his money approximately in that time, whilst the customer still pays spot cash and, as he cannot get the goods at all till he has paid for them, the producer is really safer then when doing credit business at home. Accessories, *i.e.*, fitments for cars, usually supplied mainly to private users, as distinct from manufacturers' supplies, are generally handled here either by branch houses of the American firms, or—and more generally—by jobbers, who, in exchange for the sole concession of their supply, contract for quantities as may be arranged and make their own arrangements for handling the trade, the goods being generally catalogued at substantially higher figures to cover freight, charges and risks of handling. This, like the trade in pleasure cars, is an old-established branch of the internation trade, and stands on quite a different footing from the business in trucks, or component parts, which is quite new and has only been developed by and since the commencement of the war.

THIRTY MILLION DOLLAR TREASURE CARRIED BY COMMERCIAL CARS

The largest shipment of treasure in the history of Wall Street, the financial center of New York City, was received on August 7th when 920 steel bound sealed boxes, containing $19,534,200 in gold and other securities, which brought the total up to $29,301,300, were delivered to J. P. Morgan & Co.

The gold had come in a warship from England to Halifax, thence in seven steel cars to the American Express Co's. terminal.

Under a heavy mounted police escort and ninety-two guards armed with Winchesters and automatic pistols, the procession of gold stored in twenty-three commercial cars started in a line four city blocks long downtown to the subtreasury from the American Express Co.'s sheds at 10th Avenue and 33d Street.

The procession of commercial cars reached the subtreasury at 11.30 o'clock and the work of carrying in the precious metal began. There were forty boxes in each of the twenty-three trucks, a total of 920. Each box was bound with strips of steel and sealed.

In the unloading two men passed each box to two other men, who placed it on a hand truck. The hand trucks with eight boxes as a load were rolled into the coin receiving room, where four men with axes chopped open the boxes, each of which contained three white bags of the yellow metal.

Miscellaneous Items

The Boyce Motometer has been adopted as standard equipment on the 1000-lb. Lippard-Stewart trucks.

Pierce-Arrow Motor Car Co., Buffalo, held a truck sales convention at the factory on September 14th, 15th and 16th.

Dyneto Electric Starters and Willard Storage Batteries have been adopted as standard equipment on the new 1000-lb. Lippard-Stewart trucks.

L. G. Schoepflin Co., Buffalo, N. Y., has placed an order for twenty-five Standard trucks to be delivered as soon as possible. The sale amounts to over $50,000.

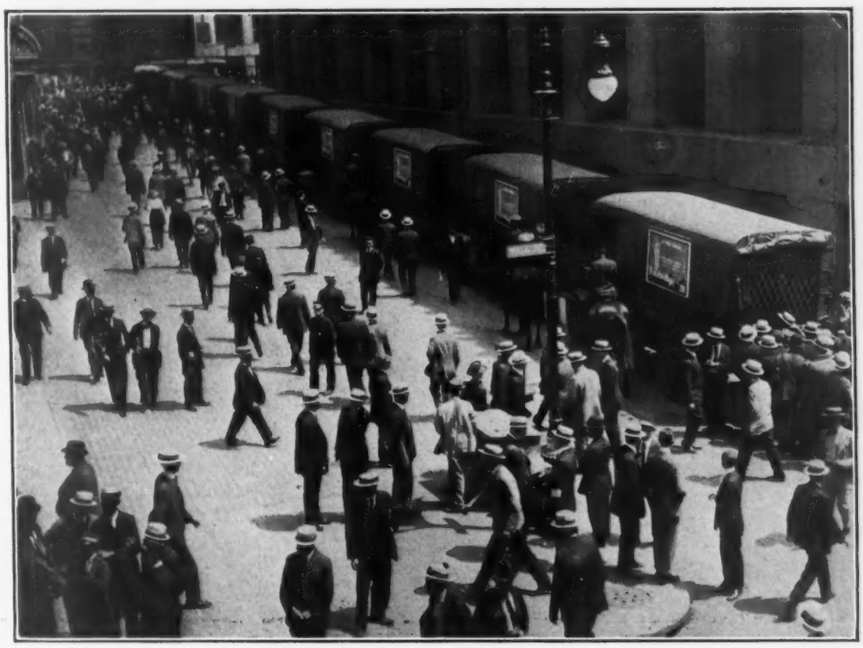
International Harvester Co. has added to its line a new truck of 2000 lbs. capacity, known as Model F. The International line now consists of 1000-lb., 1500-lb. and 2000-lb. trucks.

Baltimore Transit Co. has purchased several Garford 1-ton motor 'buses, to be operated in connection with the street railway system. Twenty-five 'buses have been ordered and ten are already in use.

Forty grocers of Hutchinson, Kans., have displayed forty delivery wagons with four commercial cars. They have formed a general delivery system by which all goods will be delivered by one central concern.

District Sales Managers of the Hupp Motor Car Co. held a quarterly sales convention, and reported business generally booming throughout the country. The motor car industry was reported in excellent shape, except for the shortage of cars.

The Post Office in Detroit is now using its first gasoline commercial cars for mail distribution service. In all thirty-six automobiles will be put into the service—twelve being used in the delivery work, assisted by twenty-four small light delivery machines, which will also be used in collections and the parcel post service.



Commercial Cars Delivering Their Burden of Gold to the United States Subtreasury

Nearly $30,000,000 in gold and securities was delivered by twenty-three commercial cars through the streets of New York City

The CCJ leads in circulation, advertising and prestige

New Light Engine of the Light Manufacturing and Foundry Company

THE Light Mfg. & Fdy. Co. of Pottstown, Pa., after gaining a reputation in the automobile trade as manufacturers of automobile and engine parts for some of the most exacting concerns in the industry, has decided to design and build for the trade an engine that it is believed will meet the demands of the present trend of pleasure car and light delivery car manufacturers. Realizing that this is a day and age of specialization this company will confine its efforts in engine production to but one type, and therefore produce a better article at a lower cost. After careful research and experimenting an engine of 3½ in. bore by 5 in. stroke was decided upon.

Specializing on a big production of one model enables them to equip with special tools, jigs and fixtures which insures a better quality of product. This equipment is being installed and engines will be coming through in quantity in January.

The following is a detailed description of this new engine, which is suitable for pleasure cars or for trucks of 1 ton capacity or under.

Crankshaft

The crankshaft is of the two bearing type, made from 40-50 carbon steel, double heat treated. The main bearings are 2 in. in diameter. The front bearing is 3 5-16 in. long, rear 4 1-16 in. long. The connecting-rod bearings are 1⅞ in. diameter by 2⅜ in. long.

In designing this shaft, great care has been taken to provide well shaped webs of exceptional strength. The largest radius possible has been used in the junction between the crankshaft and arms. With the large bearings and well shaped web the makers claim to have overcome vibration at the critical period, which is well above the maximum speed of the engine.

Flywheel

The flywheel will provide for cone or multiple disc clutch, and is bolted to the integral crankshaft flange with nickel steel bolts. For pleasure car purposes a 60-lb. flywheel will be used and for commercial a 70-lb. wheel.

Camshaft

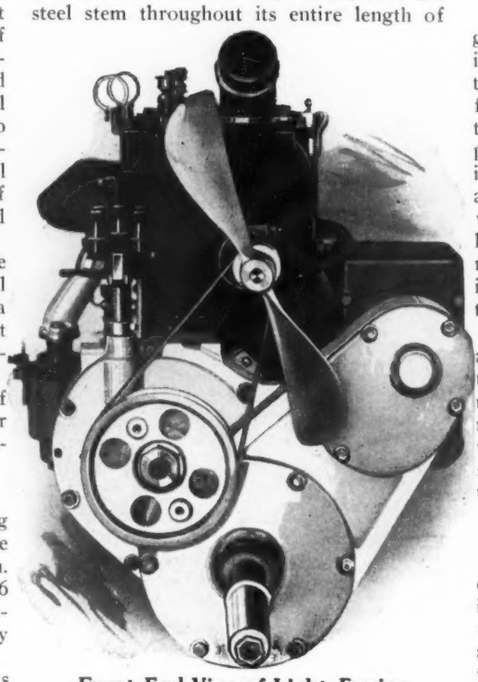
The camshaft with cams integral, is made of carbon steel 1 in. in diameter, carried on three bearings. Front 1¼ in. diameter x 2 5-16 in. long, center, 1⅞ in. diameter x 1 in. long; rear, 1 in. diameter x 2 9-16 in. long.

Timing Gears

The timing gears are helical with wide faces and of very rigid construction. They are made of mild steel and cast iron, and lubricated by means of an oil pocket cast into the lower crankcase with its overflow above the crank gear face. The thrust is taken on the cam gear by the camshaft flange running against a ground face. The gears are marked on the teeth, so that in the event of the engine being taken down, it can readily be re-assembled without changing the timing.

Valves One and a Half Inches Under the Head

The valves are located on the right side of the engine, and are made with gray iron heads. The cast head is fused to the steel stem throughout its entire length of contact with the stem. The lower end of the stem is hardened. Exceptional power and speed are accounted for by providing generous sized valves.



Front-End View of Light Engine

Push Rods

Push rods are of the flat head type, made of a special case hardened steel, properly hardened and ground, and provided with hardened adjusting screws and lock nuts.

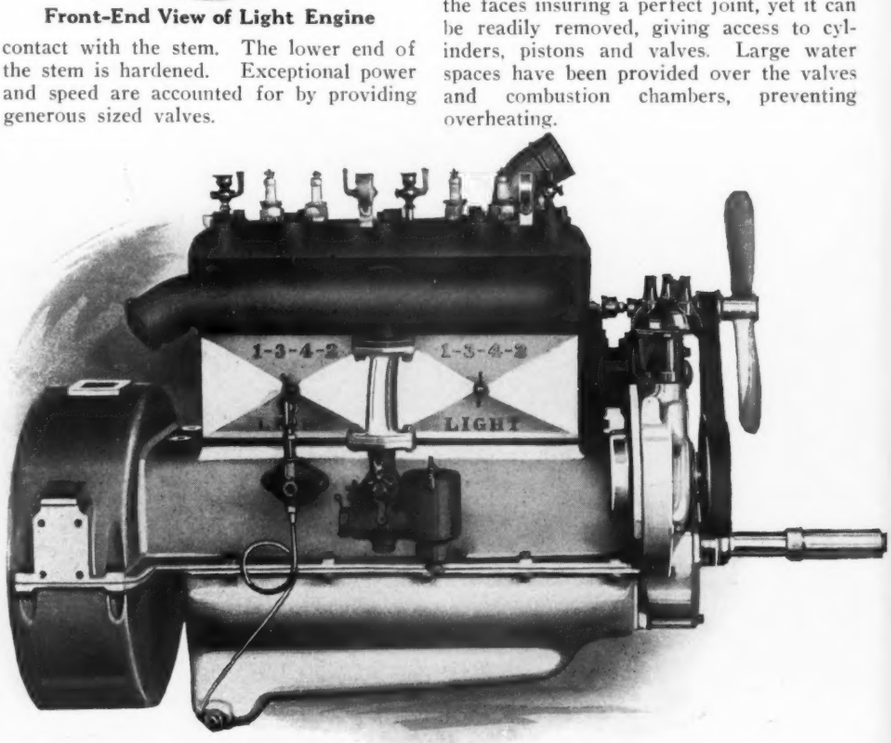
Cylinders

The cylinders are made of the finest gray iron, close grained, are L-head cast in block. The casting is designed for detachable head. This allows more space for large valves. Also, the opening on top of the cylinder greatly facilitates the production of perfect and uniform castings, the removal of core sand, core wires, and insures even thickness of cylinder walls after machining. Great stress is laid on the fact that water entirely surrounds each cylinder and the valves giving uniform expansion and overcoming the trouble of warped valve seats.

After being rough bored, the castings are set aside for aging; this eliminates distortion due to uneven strains on the metals. Before the cylinders are finished machined, they undergo a rigid test of water pressure to guard against the slightest leak or imperfection. They are then bored and finished to a standard size.

Cylinder Head

The cylinder head is of the same quality of iron as used in the cylinder. It is held in place with fifteen nickel-steel bolts, with very long threaded ends, clamping an asbestos filled copper gasket between the faces insuring a perfect joint, yet it can be readily removed, giving access to cylinders, pistons and valves. Large water spaces have been provided over the valves and combustion chambers, preventing overheating.



Right Side of the New Light Engine

Bore 3½ in., stroke 5 in., L-head. Note the short aluminum intake manifold, which permits individual requirements as to carburetor location

The CCJ has most advertisers because it gives them biggest returns

Pistons

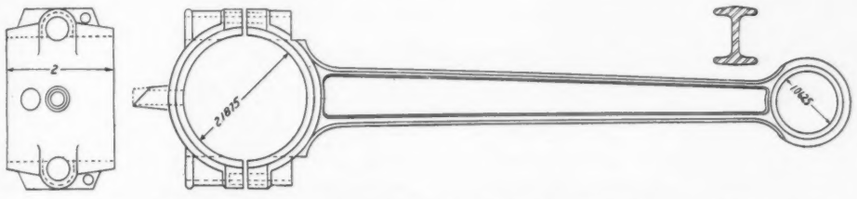
The pistons can be furnished of cast iron or of the Magnalium, a special aluminum metal; the cost of the latter is slightly higher than for cast iron, but allows a much higher engine speed with less chance of vibration. They are carefully turned, being centered from the inside to insure even thickness of the walls. After being rough turned, they are heat treated before being ground to size. This eliminates the chance of the piston growing out of round in use.

Wrist Pin

The wrist pin is hollow and made of a high grade case hardening steel, properly treated and ground to size. Each pin is given a test under a sclerescope for hardness. The pins are prevented from side slip by a set screw through the base and a cotter pin through the inner end of the set screw.

Connecting-Rod

The connecting-rods are of I-section type, drop forged, 35-40 carbon, properly heat-treated. The rod is 10 in. long from center to center. The lower end of the rod is of split type, the cap being retained by two nickel-steel bolts. The rods are fitted with the company's own metal bearings, and are adjusted by means of brass shims. The upper end is fitted with a bronze bushing, furnishing a large bearing for the piston pin.



Connecting-Rod of Light Manufacturing and Foundry Company's Motor
This rod is 10 in. center to center, a 35-40 carbon drop forging. The removable cap at the lower end is held by two nickel-steel bolts, and positioned by two dowel pins

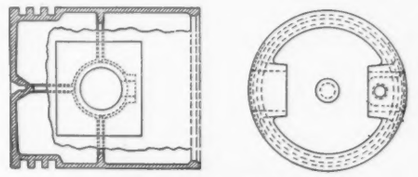
Bearings

The crank, cam and connecting-rod bearings are also of their own make; they are die cast of the highest grade of nickel babbitt. The crank and connecting-rod bearings, after being carefully fitted, are broached with a special fixture, which tends to seat the metal perfectly. After this, they are line reamed and fitted, which gives them an exceptionally large percentage of actual bearing surface, the connecting-rod bearing having a mean pressure of only 600 lbs. per sq. in. of projected area, assuring maximum mileage without undue wear.

Crankcase

The crankcase is made of aluminum constructed with reinforcing ribs. The bearing caps for the crankshaft are held in place by studs, and are heavily webbed and easily removed. In the crankcase, oil pockets are provided over the bearings to insure perfect lubrication. For unit construction, the crankcase upper carries one-half the bell housing. The lower half of the housing is bolted on by six cap bolts and entirely encloses the flywheel and clutch. The housing is the proper size for standard transmissions. The crankcase can be provided with the open flywheel type and is provided with bosses for attaching the rear support. Provisions have been made for the attaching of a lighting or motor-generator, the same being driven from the front end of the crankshaft by the starting motor mounted on the left side of crankcase and to the flywheel housing, the flywheel having teeth cut integral for a Bendix gear drive.

The lower half of the crankcase is of aluminum, securely bolted to the crankcase upper and provides an oil reservoir with a capacity of one gallon.



Magnalium Piston
These pistons are very light, reinforced as shown, at the lower edge. To prevent scoring of the cylinder wall, due to expansion of the bosses and pin, the area shown within the square is depressed below the rest of the surface.

silent chains entirely enclosed. Adjustment of the chain has been provided for also. Different makes of instruments can be installed by changing the support bracket.

When a two-unit starting and lighting equipment is used, the generator can either be driven by gears or a silent chain and

Cylinder and Crankcase Cast Integral

For the car builder who does not object to a small amount of additional weight, the cylinder and crankcase upper half can be furnished cast integral of a special gray iron. This is an ideal construction, as it gives more rigidly to the entire engine.

Manifolds

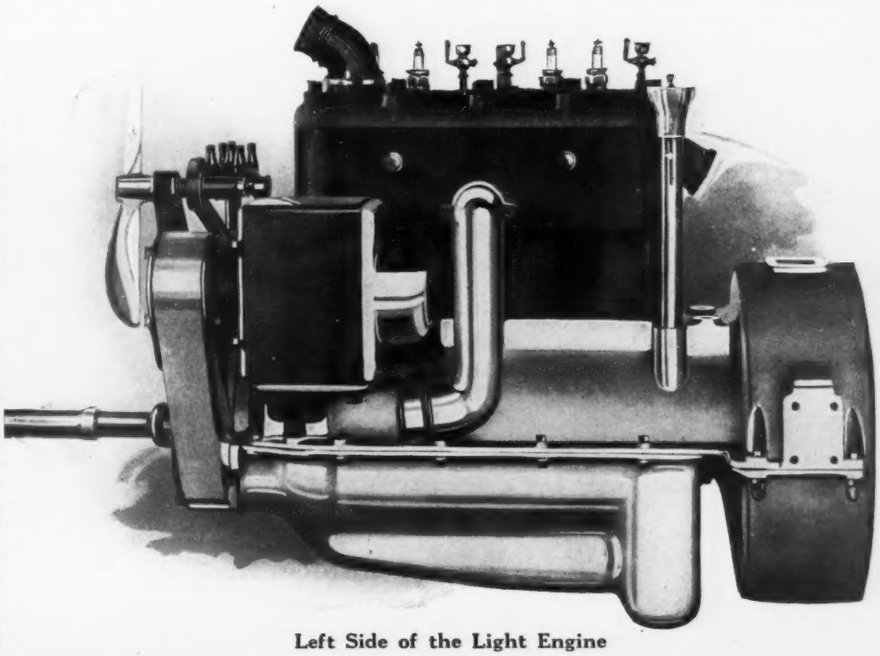
The exhaust manifold is of cast iron, securely bolted to the cylinder with studs and is provided with large passages to eliminate any possibility of back pressure. The intake manifold is but a short vertical pipe flanged at each end and made of aluminum and bolted to the exhaust manifold as shown in the accompanying illustration. This construction makes it possible to give to each customer a manifold to meet his own requirements as to carburetor location.

Lubrication

A plunger pump is used driven by an eccentric on the camshaft. The oil is pumped from the reservoir through a screen to prevent carbon and dirt that may collect from being forced through the pump. The oil is forced through a duct in the oil pan to each of the troughs that are provided for each connecting-rod, which dips a small amount each revolution, the splash filling the oil pockets provided over the crankshaft bearings and also lubricating the pistons and cylinder walls. A part of the oil is also carried to the front end of the engine for the camshaft front bearing, the overflow caring for the timing gears and the motor generator chain. A plug in the bottom of the oil pan has been provided for draining the oil; the strainer can also be removed for cleaning. An oil gage is located on the left side of the engine plainly indicating the high and low level of the oil.

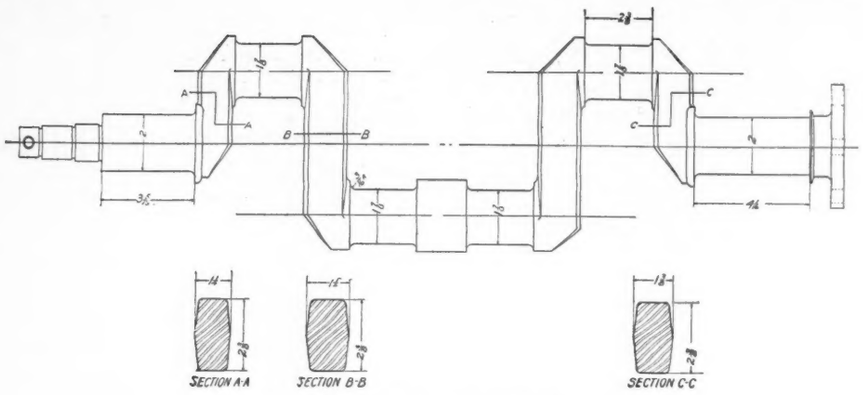
Cooling

Thermo-syphon system is provided. The water jackets are extremely large. The



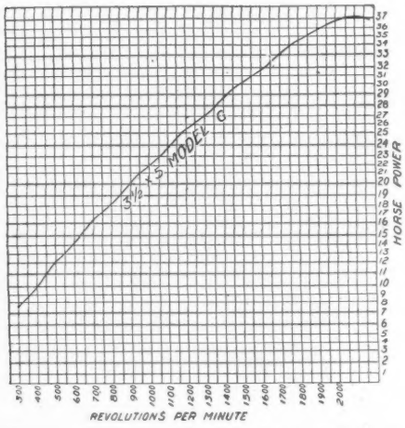
Left Side of the Light Engine

The CCJ has most readers because it gives most information



Two-Bearing Crankshaft

The shaft here shown is provided with unusually large crank webs and liberal diameter crank pin and main bearings to prevent any torsion due to twisting action. It is claimed by the company that there is absolutely no vibration set up in this shaft.



Horsepower Curve—Light Manufacturing & Foundry Company's Motor

Showing an increasing power development up to comparatively high speeds

cylinder barrels and valves being independent of each other, allow the water to circulate all around them. Extra large inlet and outlet pipes are provided, being bolted to the cylinder and cylinder head.

Cooling is assisted by an aeroplane type one-piece two-bladed cast aluminum fan, with steel stem running in along cast iron bearing with eccentric mounting for belt adjustment.

Ignition

Any make of timer for battery ignition can be used or any make of magneto can be installed. Quotations do not include this equipment; the purchaser can therefore specify the system desired. The manufacturers will, for a small extra charge, if these instruments are shipped to them, mount, time and test the same with the engine.

Inspection

The work as it passes through the shop is inspected after each operation, and has a final inspection before being put in finished stock or assembled to the engine. This insures interchangeability of all engine parts.

Balance

All crankshafts and flywheels are given a running or revolving balance on the Norton balancing machine. The pistons and connecting-rods are weighed together to within one-half ounce. This, together with light reciprocating parts, overcomes torsional vibration at high engine speeds.

Assembling and Testing

The assembling is done in the most careful manner. Each workman has a part of an engine to fit up, and by dividing the work in this manner they become skilled to perfection.

After the engine is assembled, it is run with all bearings and cylinders flooded with oil. After they are properly limbered up, they are run under their own power, pulling a full load at top speed for ten hours. After this severe test, the engines are taken down and all bearings and parts are examined for defects or undue wear.

A TRUCK USED IN THE BREAD BUSINESS

The truck shown in the illustration, made by the Durable Dayton Truck Co., Dayton, Ohio, has been in continuous service for 12 months and has made a daily trip of 90 miles each day, the principal run being between Dayton and Hamilton and back. What makes this run more remarkable, is the fact that this trip was commenced from Dayton in the evening and the return trip made in the very early morning before daybreak, which meant that the complete journey was made in the dark.

The weather made no alterations in the schedule, and frequently the trip had to be made over new roads, and in the winter encountered many times 15 in. of snow without reducing the capacity haul of 4 tons or changing the schedule in any way.

The expense of running this trip was:

	Per Day
One man	$2.50
Fifteen gallons gasoline, at $.11	1.65
Oil	.25
Tires	.50
Mechanical repairs on car	.05
Depreciation	1.45
Total	$6.50

Against this we have:

	Per Day
Railroad haul on 8000 lbs. at $.14	$11.20
Extra loading and unloading	1.00
Advertising value of truck	.30
Total	$12.50

This shows a difference in favor of the truck of $6 per day.

Six dollars a day, and 365 days per year, amounts to $2190, which amount would practically pay for the running of a double service and the opening up of a new territory along the same route.

The figures shown are as near correct as it is possible to get them, and the item of tires, which may seem low, is actually higher than what they cost. The reason, we presume, was in the quality of the tires and principally the loading of the truck, which is distributed in such a manner, and the construction of the truck is such that the wear on tires is uniform all around.

The construction of the rear end of the "Durable Dayton" truck insures at all times equal distribution of loads on front and rear wheels, reducing thereby cause of any slips and consequent wear on the tires by having the driving with each rear wheel alike.

The cost of this truck, including the body, was in the neighborhood of $3400.

Durable Dayton Truck Carries Bread

This truck averages ninety miles per day and has been in continuous service for over a year, and shows a saving of $6 per day over haulage by railroad

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Introducing Trucks Into the Mule Country

Some Stunts by Progressive Agents, and the Results

By W. LIVINGSTON LARNED

FOR five years or more, industrious and efficient local dealers, salesmen and hustling agents, have attempted to convince the farmers of Florida that the motor truck will solve one of his most serious economic problems.

But the mule has won every time.

That is, he came out on top until about five months ago. A winding, palmetto-shaded brick highway through miles of fertile and productive country did more for the commercial car in one part of Florida, at least, than plain, blunt, honest talk, covering a period of the five years mentioned.

And now Mr. Mule is on the skid. With his fits of temper and his stiff ears and his studied stupidity, he is destined to gradually disappear.

Not two years ago, there was but one recognized route to go by vehicle from Jacksonville, Florida, to St. Augustine. We want to tell you the short story of that road because it illustrates a trucking moral of general State-wide truth.

Of late years, homesteaders have flocked to the South, and especially to Florida, where the lure of the cheap farm is painted in glowing and orange-tinted colors.

Now these farms and homes and haphazard establishments, in various stages of success or failure, do not always have sidings to the main railroad line. Crops must be taken here and there and taken quickly, for lettuce, cucumbers, oranges, cabbages, tomatoes, etc., will not stand time-dawdling.

Then there are mountains of potatoes, whole orange and grapefruit groves in their commercial crates, and potash and turpentine and fine lumber and coquina for building and white sand that is par-excellent for the busy contractor.

Mr. Commercial Car Dealer, you see, has something to "work on." His only drawback, to date, has been the stubborn opposition of the old-timers.

Here is a list of some of the reasons set forth as legitimate arguments against gas-and-electric power vs. mule:

"Roads are too bad. Automobile trucks could never get through the sand."

"Upkeep prohibitive. After we put 'em in, th' Trust would raise th' price of gasoline to anything they want."

"Cost less to feed a mule or a hoss, raisin' our own stuff, than to buy grease and gasoline and stand mechanical upkeep."

"Danger to live stock, chickens and our children."

"Dust."

"Take too long to learn to run a car and we can't afford a driver."

"Automobile trucks require a thorough knowledge of machinery—anybody can mend a wagon."

"Tire bills."

"Too difficult to settle on which would be th' best type of car to purchase."

"Tear up th' roads and make 'em worse than they are NOW."

Every one of these points was met. The dealer proved his case and still motor trucks were not in as general and as common use as commonsense dictated. And then along came the good roads committee.

Bonds to the tune of a very pretty penny were issued, after one of the bitterest and most hotly contested battles in the history of the State and the county was fought, and work was immediately begun on a fine, clean, safe brick highway almost into the suburbs of Jacksonville.

Farmers had opposed it for no earthly reason that was worth a stump speech. But five minutes following its completion things began to happen and one of them was the commercial car. It spread from those two counties out and down and across everywhere, until now Florida, as a State, is apt to be more enterprising in this respect than any other Southern sister community.

One thing only had been necessary—where the truck cut off from the brick highway and shunted off over a soft, mushy lane of treacherous sand, it had been necessary to "doctor" the course. The coral-like coquina attended to this, together with the customary Florida method of "cording."

Within a week every farmer along the Jacksonville-St. Augustine brick road had heard the story of that wonderful commercial car. It spread as quickly as fire in dry bayonets. "They had done a week's hoss or mule work at truckin' at th' Pecan Grove in one day!

The first healthy sign was the bettering of tributary roads. And property that you could buy for a thank-you ma'am an acre years ago is worth all kinds of real money to-day.

It is no surprising sight to see auto trucks, delivery cars of various makes and types and fine, big rough-work commercial vehicles of the mastadon class scooting back and forth along Florida's most beautiful brick "turnpike." They have materialized mysteriously and all-of-a-suddint. The mule keeps to the plow. It takes him far too long to run down to the village for supplies.

Southern dealers have smashed down opposition in a really ingenious and astounding manner.

Suppose we cite some of the clever "stunts" that were resorted to by successful dealers. They are practical for you in your section.

The Dealer Proved His Case

But still commercial cars were not in as general use as common sense dictated

The Beginning

One day, a farmer, driving a tired nag, seven miles out from St. Augustine, drew his horse up sharply and watched a black spot in the far distance, as it gradually developed and became something tangible and real.

It was a commercial car and a sizable one.

Before the farmer could think very much on the subject, it buzzed past, with so little friction or fuss or dust that it was well into the sawmill woods when his tired nag broke into a limping trot again. The truck was filled with fertilizer and was on its way to one of the big pecan groves.

That one car delivered sixteen loads of fertilizer to the grove between the hours of 7 a.m. and 6 p.m. The work was done economically, with minimum effort.

A month before, horses and mules had died along that same deadly, tedious, hot trail. And to bring ten loads of freshly-cut pine timber from the suburbs of New Augustine had caused everybody concerned to groan with apprehension.

The Case of the Sawmill Man

One big sawmill man in Georgia had two hundred mules. They were fine animals, in the pink of condition and giving top-notch service. The State Road ran right through three thousand acres of the owner's timber land and the haul was a matter of seven miles only. Politics had prevented the jerk-water railroad line from getting near the property and, in any event, any number of short hauls, criss-cross trips to

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

local building activities, etc., had made this immense stable a trade necessity. The progressive auto dealer in the adjoining town was a personal friend of the mill operator, and had been after him for seven months.

"You've got brains," he said, "you know as well as I do that you need auto trucks here—that they'll be cheaper and better and more progressive. The State Road is in fine shape and the red clay roads have just been finished. You're running a mule hotel and the bunch is eating you out of house and home. I've been over to your place, Bill, and I know what I'm talking about. You have three horseshoeing establishments, a big machine shop, a veterinarian and the good Lord only knows what else. Why don't you put in a sizable fleet of trucks?"

The answer was always evasively the same:

"Lot of truth in what you say, but what's th' use of me takin' up all that trouble. I've got my mules. They're not botherin' me. The system is established and I'm making profit enough to satisfy me and my wife. I'm tolerable old and it's sort of late to take up a new game."

Disposing of the Mules

In the showdown, it was a case of the mules—always the mules. It was too much trouble to get rid of them. And that was the dealer's stumbling block.

So he promptly put the skids under it.

He jumped on the Seaboard, went to New York, dickered around for a week with the horse and mule exchanges and finally got a fine price for the fine mules—a price slightly inflated, as a matter of fact, for the carload of mules finally reached Yonkers, where they were shipped abroad by transport. This neatly settled, the live dealer hurried right back home, put the story squarely up to his friend, and made him see the commonsense of twentieth century transportation methods. The mules went North in five days and the agent in question landed an order for thirty fine trucks. It was one of the biggest truck orders that had ever crossed the Mason and Dixon Line. A little thing like an army of mules never stopped him for a minute. The average man would scarcely have deemed this sort of "outside" work in his province.

And there is the case of the fat order for commercial cars that went to that big diversified farm in middle Georgia. Atlanta dealers are still "sore as crabs" over losing out on the proposition. A dealer in a local town took the money right out from under their noses.

Old M. K. Marx, 250 lbs. heavy and strictly a member of the "Old School," had kept on adding side-lines to his already large farm until he practically owned a county and a half of prime land.

The writer has been over his place. It's wonderful! Marx has miles of cotton, his own gins, his own compresses, his own cottonseed oil works, his own railroad, his own stores and canning plants and blacksmith shops and a hundred other items, each a little world in its own right. The farm is a perfectly managed community of manifold industries.

Up to a short while ago they used wagon and drays and the asthmatic little dummy engines. Marx has no less than two hundred vehicles which were chalked up in his team manager's shanty.

Marx was a believer in good roads—he had them on his place. But no one had ever been able to convince him that auto trucks were preferable to the old-fashioned manner of hauling.

His secretary had been besieged by catalogues, dealers, agents and rapid-fire mailing card campaigns. He didn't want to change the whole atmosphere of his farm.

You can't guess by what simple expedient his mind was changed?

Pride did it.

It was customary for a bunch of the farm wagons and drays and other vehicles to "tie-up" in a big vacant lot a block from the court house in the village. On Saturday mornings, Marx was apt to be represented by two dozen, and they were not particularly pretty affairs to look upon after years of hard service. On Saturdays Marx came to town himself.

The local commercial car man, who was also agent for a well-known pleasure car of the smaller type and who didn't even have a machine in his place, dealt in strategy of the shrewdest description. He corresponded with the manufacturer and four or five cars were shipped down. A professional chauffeur came along to "break in" some drivers.

Marx's most progressive rival was a Scotchman, who owned a great many adjoining acres of land planted in cotton. The Scotch, of course, are always on the lookout for "bargains" and economic measures of a safe character. The dealer admitted that he wished a "well-known farmer and local patron saint" to first test the goodness of these trucks. Drivers would be furnished free and any sort of hauling would be done at no cost save gasoline and oil. It was stipulated that, when not actually engaged in hauling, the trucks were to be "parked" in the big lot below Court House Square. And they were to be there all day Saturday of each week. The suggestion was immediately adopted by both father and son as an extremely sensible one.

There is nothing subtle to the scheme. You can readily see for yourself what happened. The Scotchman swaggered and puffed around in great shape and did a vast amount of practical work with the trucks. He "rubbed it in" the Marx drivers whenever he got a chance, and his son was almost vicious in this respect. Marx not only saw the trucks when they were standing in the lot, but his own traps looked mighty cheap and shoddy and weak by comparison. His friends "joshed" him on the subject and at the expiration of two weeks the situation had become pretty serious. It was becoming a personal matter.

Pride—and nothing else—made Marx put in an order for a fine initial batch of commercial cars. And he really needed them. There had been no question of that all along. The order was clinched and cinched without further campaigning on the part of the local dealer. But here is the pretty part of the incident—the Scotch cotton planter actually bought the first five trucks and at least twenty other sales were made elsewhere in the village.

Marx Gets the Laugh

His business rival, the Scot, with his splendid commercial cars makes Marx look cheap

Free Transportation and the Result

Another dealer in South Carolina had paid his rent for a year and had a floor full of cars before he finally awakened to the fact that a whole string of predecessors had "gone on the rocks" in that same town. The farmers and tradesmen just wouldn't listen to reason. Trucks had been dinned into their ears for two years without ruffling a feather.

The dealer, a technical graduate from a Georgia institution, had been a careful student of human nature. After his first setback he didn't force matters at all. He put the biggest commercial car he had in the shop in active operation. He allowed it to become generally known that the truck was at the service of picnics, school jamborees, club jaunts to nearby parks and the like. As the truck was much faster, in the long run, than tired horses, it was inevitable that comparisons should be made. There was no suggestion of a carefully-planned advertising "dodge." Clubs composed of prominent citizens, at one time or another, rode on that truck and saw it do the work.

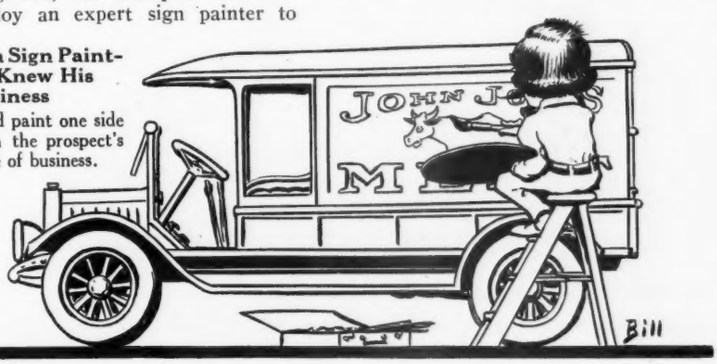
Inside of three months he had worked up a good business.

When some new potash mines were started not far from Ocala, Florida, an enterprising truck dealer had two machines on the spot a week before the first spadeful of earth was dug for the outbuildings. And when the hauling began he didn't talk auto trucks as much as he demonstrated them. Nothing was left to the imagination. He kept a little set of simple books, showing exactly what the mules and horses did, and the record of his two trucks. The proof was conclusive and he made a nice sale.

Painting Trucks for Personal Appeal

In Anniston, Alabama, tradesmen seemed opposed to any innovation in their delivery system. Although they could purchase neat, inexpensive, attractive motor-driven delivery wagons on "easy terms," they could not be weaned away from their deplorably slow and inefficient horse outfits. The situation had reached a deadlock.

And then a dealer with more than the ordinary amount of far-sightedness and initiative hit upon the scheme of painting up trucks for personal appeal. We use his own phraseology. He would look over his list of prospects and pick out a reliable, well-to-do grocer, for example. Then he would employ an expert sign painter to actually paint one side of the delivery—paint on the name of the tradesman, his business, address, some pictorial theme or even a letter-head, trade-mark or family crest. Wherever possible, an intimate touch was introduced—a bit of this or that dear to the heart of the possible purchaser.



Employed a Sign Painter Who Knew His Business

Who would paint one side of a car with the prospect's name and line of business.

It is highly interesting to note that in five cases out of seven this remarkably ingenious ruse worked. Once more pride became the dominant factor. The tradesman saw the motor truck or wagon in an entirely different light. Here was one for him and him alone—there was his name and his address and a beautiful picture symbolic of his trade. It certainly looked pretty—there was no getting around that. It is the same principle that applies to form letters. A man is more than apt to turn up his nose at an obviously "set," cut-and-dried machine-made letter. If the first two or three lines refer to something intimate and concerning his own business, he will read the correspondence through—he can't help it—human nature is behind the propelling power.

Our Anniston dealer employed a sign-writer who knew his business. If the job "went through" and the order was landed, a consistent price was paid for the sign. If not, the artist received but a nominal fee. In case the customer still held out, a new design was put in the place of the old one, an adjustable varnished panel being used.

The "Hoss Swoppin' Convention"

Perhaps one of the most clever ideas was that of the whirlwind Winder campaign.

For twenty years, at Winder, Ga., they have held, once a year, what is known as a "Hoss Swoppin' Convention." Traders from all over the State congregate in this little country town for three days. It is a gala event. Horses and mules of every shape, size and condition are brought to Winder and given headquarters on the outskirts of the place, in a shady stretch of woodland.

Then the "swoppin'" begins.

The main idea seems to be for one man to get somebody elses hoss and as much else "to boot" as possible.

A Macon commercial car man heard of the Winder three-day swop and drove over in a tractor from his nearest branch, with three typical service cars trailing on behind. What he did to that convention was aplenty. He bumped the tractor and the nice, bright red and green and dark royal blue vehicles right into the very middle of the first-day crowd and did a cart-tail oratory stunt that was a wonder. He had previously wired for plenty of literature—catalogues, folders, illustrated leaflets, government reports, etc., and was not stingy with them.

He told those farmers that progressive Georgia was hauling with electric and gasoline power—not sick mule and horse-meat. He got clean away from the same old hackneyed arguments and talked the sort of turkey that men of the soil understand and can assimilate. He made little sections of them climb aboard and he took them out for 10-mile drives over all sorts of roads. It's the getting in of a man in a commercial car that makes the sale many times. You thrill him—as he feels the purr of the engine and sees how easily everything responds, he gets a brand new idea of motor trucks. He acquires that "B'gosh, I kin run her, too," sensation.

One or two more demonstrations like that will break up the famous Winder Hoss Swoppin' Conventions. That first one put an awful dent in them.

AN OVERLAND CAR USED AS A FARM TRACTOR

After driving a 1912 Overland touring car more than twenty thousand miles over the rough roads of Saskatchewan, A. W. Bell, a native of Saskatoon, conceived the idea of putting it to work on his farm. His theory was that if the car could stand three years of traveling over the so-called roads of that section of the country, it could go a step better and do the practical work.

The Overland car, made by the Willys-Overland Co., Toledo, Ohio, was converted into a tractor by the simple arrangement of putting in an extra axle under the frame, 2 ft. in front of the rear axle of the car, on which were placed two binder wheels. After removing the rear wheels of his car, Bell replaced them with small sprocket wheels which were connected with large sprockets on the drive wheels by a chain. This reduced the speed of the car and gave it more power.

Practically all of Bell's neighbors who were interested in his experiment believed the scheme to be impractical. They tried to convince him that the engine would heat up too much and declared the gears could not possibly stand the continous strain.

But, although the machine has been in almost constant use throughout the summer, no trouble has been developed. It has been run as many as 14 hours a day, drawing a set of discs and a set of sixteen fast harrows, without even needing a fresh supply of water.

Bell states that he was able to seed thirty acres a day or harrow from sixty to seventy acres with his automobile. By drawing two 12-in. bushers, he managed to break five acres of soil a day, or the equivalent to the work done by six to eight horses.

The Overland consumed just 70 gallons of gasoline to put in the crop, while the cost of horse feed alone would have more than doubled the expenditure. The saving in time and labor was another important item.

It took less than an hour to change the rigging of the car, so that at any time when its owner desired to make the trip to town, all that was necessary was to take off the farm equipment and transform the machine into a full-fledged touring car.

An Overland Touring Car Breaking New Land

The owner declares it accomplished as much work in a day as six or eight horses.
Made by Willys-Overland Company, Toledo, Ohio

The CCJ has most advertisers because it gives them biggest returns

The Yellow Taxi Cab

By WALTER A. BERMINGHAM

GOING into operation on August 2d with a beginning of fifty taxicabs, the Yellow Taxicab Co., of Chicago, Ill., inaugurated a novelty in urban motor passenger transportation in Chicago, by placing an excellent taxicab service on the streets, so excellent, that its motor service, appealing to an expectant popular demand and with a published statement that it was experimental, in a week's time has demonstrated that its investment has met a popular demand, as the "Yellow Taxis" have at once caught public favor.

The Yellow Taxicab Co. is an off-shoot of the Walden W. Shaw Company, operators of a superb limousine service, and is owned and operated by the same men who control the latter corporation, although there will be no conflict between them, nor any system of co-operation. The new company operate from a practically new and spacious garage, Nos. 2432-34-36-38 South Park Avenue.

The claim of the lowest hour rate in the world, $2.50, is made, for one passenger, a rate of the first one-third mile, $.30; each additional one-third mile, $.10; and for each additional passenger, above one, for entire trip, $.10. Cabs by the hour must be arranged through the garage. These rates are twenty-five per cent. lower than those provided by the City ordinance. Every cab carries a meter sealed by the City Sealer, making overcharge doubtful.

The Yellow Cabs are driven by bonded, and married men only, and, as a part of the scheme to make the system honest, comfortable and convenient and fill the quick public want to the last details, profit sharing to the amount of twenty-five per cent. of the net profits of the company, distributed quarterly, is offered as an inducement to the drivers to make them courteous as well as business-like.

Novel and convenient dispatching is installed by the Automatic Telephone Co., by a flash-light system, which on a telephone call, their dispatcher lights all the lights in the district where the call comes from. The first driver to see the light answers and as soon as he lifts the receiver, all the lights on that circuit will go out, showing that the order has been filled. Rapid service seems assured by the system.

The company claims with its low rates, public stands are impossible and unprofitable, hence, "Yellow Cabs" will be picked up on the street and by telephone. There will be no charge accounts in connection with the company's operation. No private branches, but twenty-six public stations in the "Loop." Cabs will call anywhere in the city without extra charge and passengers only pay for the time or distance they travel.

A Yellow Taxi Cab

A Chicago idea for city transit at low cost

While the cabs are light in construction, roomy and comfortable, a promise is made by the company that cleanliness will be a feature, as they will undergo a careful daily inspection. Safety devices are part of their equipment and drivers are compelled to observe rigid rules imposed by the company relating to the speed ordinance, railway crossings, crowded streets and traffic congestion.

All of the fifty "Yellow Taxicabs" now in commission, with one hundred more under way, are constructed entirely in the Walden W. Shaw Co.'s shops. The specifications include for each taxi, a Continental 3½x5; 24 h.p. engine, transmission, Brown-Lipe model 30, Timken rear and front axles, Hotchkiss drive, Thermo-syphon cooling system, set spark ignition, emergency brake connected direct with transmission and main shaft, engine three-point suspension, radiator trunnions cast integral with front engine support, Ross steering gear, control—foot accelerator, semi-elliptic springs throughout, made of chromo-silico manganese, length of front spring 35 in. rear spring 48 in., the rear spring hanger is integral with side bar members, 1-in Schebler carburetor, Bosch high tension N. U. 4 magneto, tires Fisk Q. D. clincher and non-skid, wheels 30x3½ in. 108 in. wheelbase.

The success of this service, which already seems assured, means the placing in commission within a very short time, of at least one thousand "Yellow Taxicabs," or more, until the public demand is satisfied.

Chicago's Yellow Taxi Cab Service

A group of drivers in uniform; all married men. Manager Thomas Hogan at right. Assistant manager H. T. Garvey at left.

The CCJ has most readers because it gives most information

Motor Truck Design and Construction Made Plain

Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is the eighteenth installment of a series of articles by this well-known writer, covering in a non-technical way the various constructions now current practice in commercial car design. These articles take up, in order, the general types of chassis, the advantages and disadvantages of each, illustrated by simple diagrams, and in logical order, motor construction, ignition, carburetion, cooling, lubrication, etc., until each part of the truck has been dealt with.

PART XVIII
THE STEERING GEAR

HORSE-drawn vehicles are ordinarily steered by means of a fifth wheel attached to the forward unit of the vehicle gear, which pivots on what is known as the king bolt. However, the divided axle is universally employed on commercial cars. This was described in the preceding chapter on "Front Axles," and the arrangement of pivoting the wheels is known in the country as the Ackerman Steering Gear.

Technically, this has been revised and at present it is based upon the principle that if the vehicle is to turn a corner without lateral slip of any of the wheels, the steering linkage must be so arranged that the axles of all wheels produced always intersect a common vertical line, this vertical line forming a momentary axis of rotation. This accounts for the use of inclined knuckle arms instead of parallel arms. When they extend toward the rear they must incline toward each other and away from each other when they extend forward of the axle. The inclination is such that the center lines of the arms produced, meet at a point near the center of the rear axle.

Wheel and Mast

Commercial cars are steered by means of hand wheels located at the upper end of the steering column. The spider of the steering wheels is secured to a shaft which generally passes down through an outer tube, usually called the mast. This shaft enters a housing at the lower end, which carries the steering mechanism to reduce the motion of the hand wheel. This steering mechanism may either consist of a rack and pinion, bevel pinion and bevel sector, worm and sector, worm and wheel, or a screw and nut.

The steering column is generally styled according to the type of steering mechanism employed. One member of the mechanism has a shaft extending through the housing and carries the steering lever, which is connected by means of a drag link to the steering arm on the front axle.

Generally the steering motion is geared down so that one and one-half turns of the hand wheel will give the steering ball arm a motion of about 60 degrees, while the lever proportions are such as to give the wheels the maximum angle in either direction.

For commercial cars, especially those designed for heavy service, it is considered best to have the steering gear back-locking or irreversible, that is so designed that any shocks received by the road wheels will not be transmitted to the operator's arms. The lighter vehicles permit the use of a slightly reversible mechanism, in which part of the shock is transmitted to the operator's arms thus reducing the shocks transmitted to the steering mechanism.

Drag Links and Tie Rods

Drag links are usually of the same proportions as the tie rod of the axle and the general practice is to provide cushion springs to absorb some of the shock which is transmitted to the steering mechanism.

There are various constructions of either the steering mechanism or drag link in use at present, and, familiar as the steering gear is, even so, for the sake of completeness, it will be necessary to present some illustrations, if clearness is to be a property of the text.

Rack and Pinion Type

The rack and pinion type of steering gear, Fig. 1., is perhaps the simplest type. It consists of a hollow steering shaft which carries the hand wheel at its upper end and a spur pinion within a housing at its lower end. This pinion meshes with a spur rack the end of which extends through the housing and carries a ball to which the drag link is attached. The column has an outer tube or mast which carries a bearing for the steering shaft.

This type of steering mechanism is only used for cross steering and is completely reversible, so that the road shocks are transmitted to the operator's arms. It is practically limited to use on cars of 1000-lbs. capacity and under, and where the steering pivots can be so arranged that only part of the motion of the road wheel

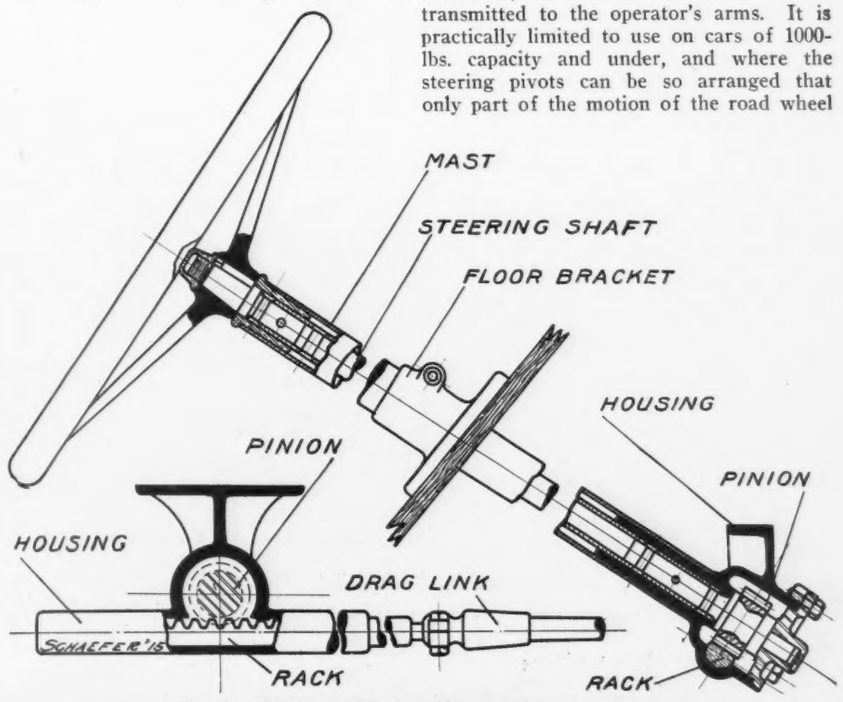


Fig. 1. Rack and Pinion Type of Steering Gear
Consisting of a hollow steering shaft which carries a hand wheel at its upper end and a spur pinion within a housing at its lower end

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

can be transmitted to the steering mechanism.

It also possesses a disadvantage in that all the load is carried on one tooth, while all the wear also comes on one tooth, as the space in the chassis frame is not large enough to permit the proportions needed to have two or more teeth in mesh.

Bevel Pinion Type

Fig. 2. illustrates the bevel pinion and sector type of steering used on the Reo 2-ton chassis. In this consruction the steering shaft is made of solid section, which permits securely keying the hand wheel and bevel pinion to it. This, of course, is made possible by placing the spark and throttle control outside of the steering column and locating the levers below the hand wheel.

The bevel pinion meshes with a bevel gear sector which is attached to a horizontal shaft carrying the steering ball lever. The steering motion is limited by leaving a portion of the sector without teeth, while the thrust of the sector is taken on a steel roller, a spring being used to maintain the roller in contact with the sector. A large bracket forms the frame attachment and also carries the bearings for the horizontal shaft, the thrust roller, and supports the lower end of the mast.

The spark and throttle controls, instead of having the usual sector near the hand wheel, are controlled by means of friction members and springs, located below the foot board bracket, while the accelator pedal is also mounted on this bracket.

Bevel gear steering mechanisms have less need for housings than other types, al-

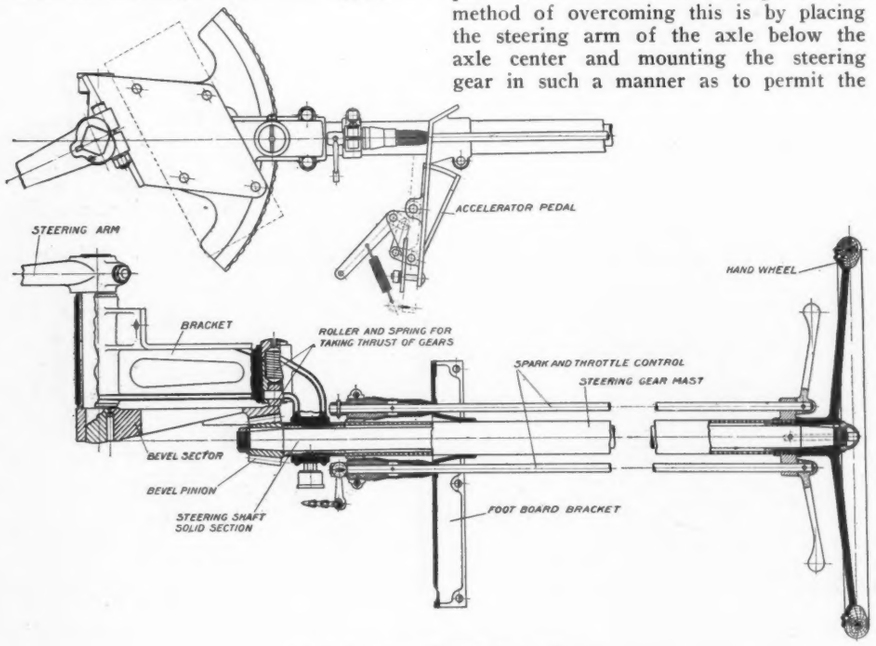


Fig. 2. Reo Bevel-Type Gear
Steering shaft is solid and steering motion is limited by leaving a portion of the sector without teeth

though in some cases they are enclosed. This type of gear is also completely reversible.

Worm and Sector Type

Fig. 3. depicts the worm and sector type of steering used on the Vulcan 5-ton chassis. It has ball thrust bearings and a hollow shaft, however but one control, that of the throttle is built in the column, the spark being controlled by mechanism mounted on the dash. The lower end of the steering shaft is riveted to a hollow shaft having an integral worm. This worm meshes with a worm gear sector mounted on a horizontal shaft and supported by bushings located in the horizontal divided case.

The customary position for the steering ball lever in the worm type of steering gears, is on the horizontal shaft, however, this position generally limits the motion of the front wheels on the side on which the steering gear is located, as the road wheel will come in contact with the drag link before it can touch any other part. With fore and aft steering the usual method of overcoming this is by placing the steering arm of the axle below the axle center and mounting the steering gear in such a manner as to permit the drag link to clear inside the front spring. However, this places the steering linkage in a position where it is practically the lowest point of the vehicle and very apt to become damaged by striking obstacles in the road. In heavy vehicles considerable clearance is usually allowed between the front spring and the frame and in the Vulcan 5-ton truck this clearance is taken advantage of to protect the steering linkage, by passing the steering arm of the axle through this space so that the drag link comes inside the frame. However, owing to the limited amount of space between the engine and the frame, the steering ball lever cannot be mounted on the horizontal shaft outside of the housing. In order to overcome this, the worm sector of the steering gear has a boss which extends through case and carries the lever. In this way the lever is placed in approximately the center of the column and has ample space for its full movement.

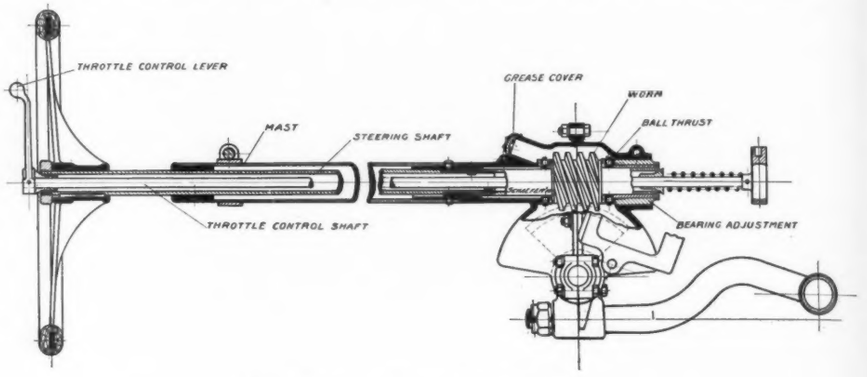


Fig. 3. Vulcan Steering Gear
Worm and sector type with ball thrust bearings

Worm and Wheel Type

The Peerless steering gear, Fig. 4. differs somewhat from those shown above, being of the worm and wheel type with friction controls mounted above the hand wheel. This hand wheel is attached to the steering shaft by means of a taper and key, while the former is made large enough to form both the shaft and the mast.

With inside controls and a mast, there is considerable difficulty in providing a shaft of proper proportions, so that in eliminating the mast, the shaft can be made ample in size. Although, it is somewhat

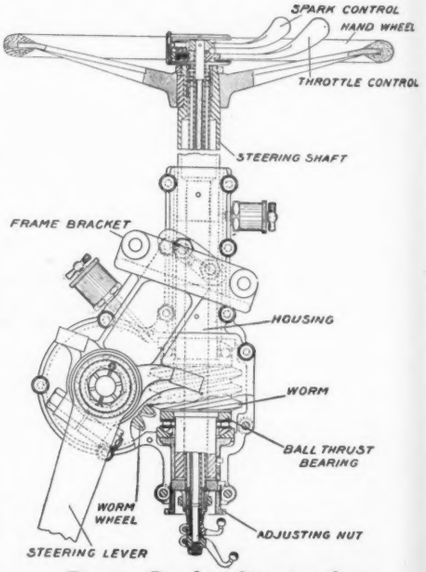


Fig. 4. Peerless Steering Gear
Which is of worm and wheel type with friction controls mounted above the hand wheel

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more difficult to provide a bracket on the foot boards, owing to the shaft turning with the hand wheel.

In this construction a complete worm wheel is used instead of a sector, and as only about 90 degrees of the worm wheel comes in contact with the worm teeth, while the wheels are moved their entire turning range, and as the shaft is squared, the steering arm can be removed and the wear taken up by turning the wheel through an angle of 90 degrees, and another quarter section brought into action. The thrust is taken on ball bearings in either direction.

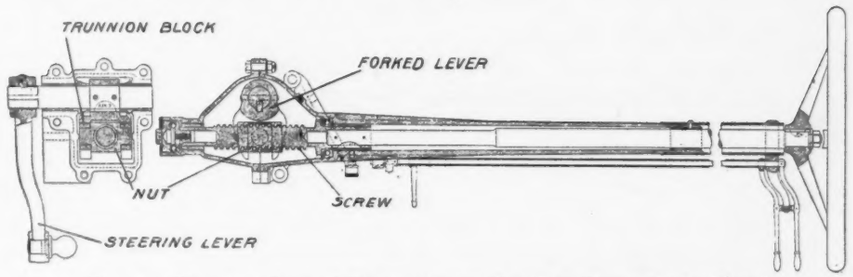

Fig. 6. Steering Gear of Pierce-Arrow Five-Ton Worm-Drive Truck
This is of screw and nut type, with solid steering shaft and multiple square-threaded screw at the lower end

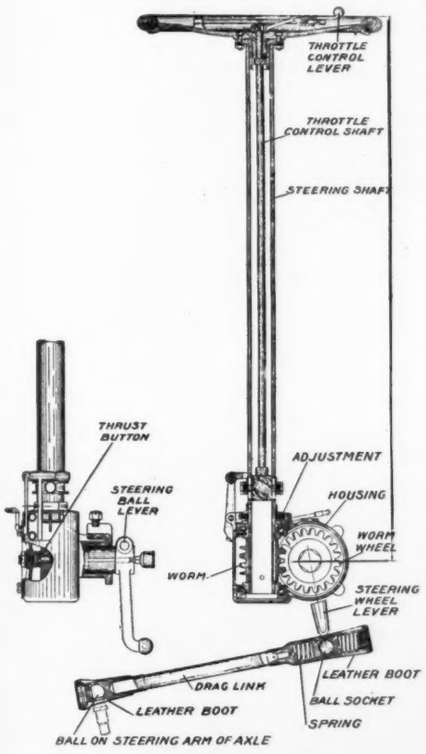

Fig. 5. Natco Steering Column
Of worm and wheel type, the housing being made in one piece, with openings for introducing the worm and wheel.

The controls consist of a stationary tube on top of which is mounted a cylindrical box, with a horizontal slot in one side through which the control levers extend. Each control lever has an extension, which carries a friction segment, being pressed against the inner wall of the cylindrical housing by a spring. The lower end of this stationary tube is rigidly attached to the housing so that it cannot rotate. A shaft and tube pass through the former to which the upper and lower levers are attached.

The Natco steering gear, Fig. 5, is also of the worm and wheel type, with suitable ball bearings to take the thrust of the worm, while a thrust button takes care of the wheel thrust. The housing is made in one piece with openings for introducing the worm and wheel. In this construction the steering shaft is also used as the mast, however the wheel is attached to the shaft by bolts and flanges. But one control is provided, with the lever located above the hand wheel, however, instead of passing the control shaft through the case, the movement of the control lever is transmitted externally by means of a double thread screw or cam. The steering shaft has slots on opposite sides directly above the housing. These are enclosed by a collar which fits over the steering shaft and carries two dowel pointed screws, which set in the threads of the cam. A fork rests on this collar and any movement of the control lever will tend to raise or lower this collar, carrying with it the fork which is connected to the carburetor.

Screw and Nut Type

Fig. 6. illustrates a screw and nut type of steering used on the Pierce 5-ton chassis. The solid steering shaft has the hand wheel keyed to its upper end and a multiple square threaded screw at its lower end. This screw actuates a nut with trunnions on its outside which carry die cast trunnion blocks that slide within the jaws of a forked lever, keyed to the steering ball lever shaft. The housing is divided horizontally and carries suitable ball thrust bearings, which are adjustable from the lower end of the housing. The spark and throttle controls are of the ratchet and sector type mounted outside of the column on the steering column mast.

Another screw and nut type of steering gear which is used on a number of trucks is the Ross, shown in Fig. 7. The hollow steering shaft carries a steel screw at its lower end mounted between two ball bearings to take up its end thrust. This screw is held to the shaft by means of a brazed joint and when the hand wheel is turned a steel block or sleeve is given lateral movement. This steel block or sleeve has a square external section and thereby is prevented from turning by the housing. On each side of the lower end of this sleeve, cylindrical recesses are turned, and cylinders, which are free to rotate, are placed in these recesses. The cylinders have slots milled in them which receive the projecting arms of the steering ball lever shaft.

The control levers are mounted above the wheel and their shafts pass through the steering shaft. The motion of these levers is reduced at the lower end by means of bevel gears.

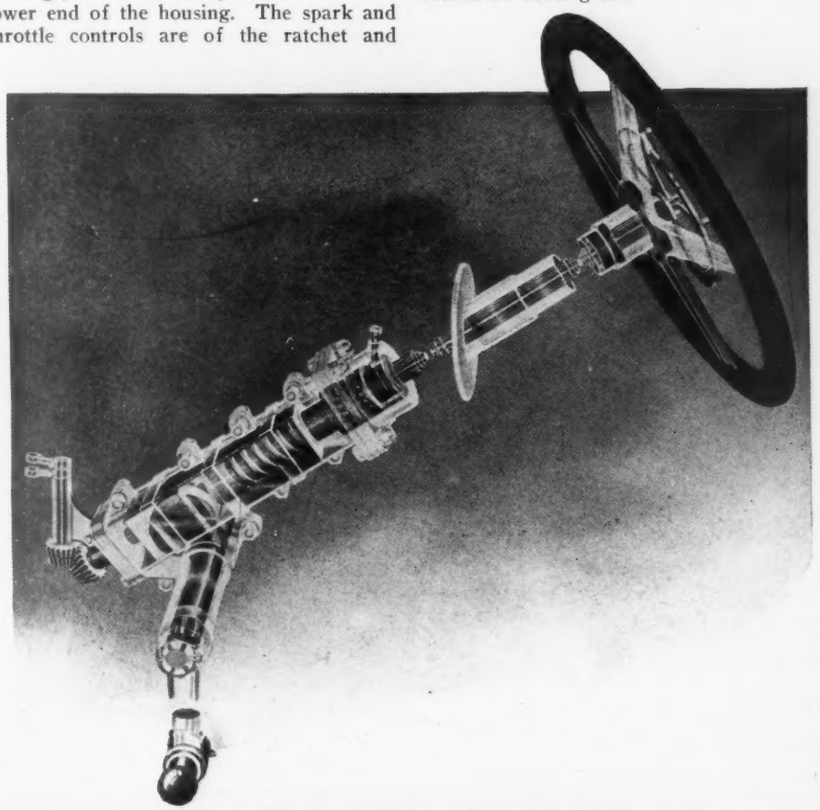

Fig. 7. Ross Screw and Nut Type Steering Gear
The hollow shaft carries a steel screw at its lower end, the screw being held by a brazed joint

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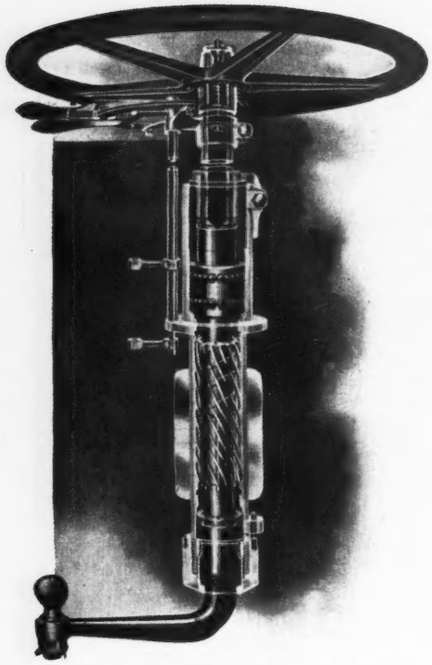

Fig. 8. Ross Screw Type Steering Gear for Cross Steering
The lower end of the steering shaft is integral with a steel screw

Cross Steering

All of the gears depicted above are best adapted to fore and aft steering, although they may in some cases be arranged for cross steering. Fig. 8 illustrates the Ross screw type of gear, especially designed for cross steering on heavy vehicles. The lower end of the steering shaft is integral with a steel screw, which, when turned by the hand wheel, gives a bronze sleeve longitudinal motion. This bronze sleeve is threaded internally to receive the steel screw and has spirals milled upon its external surface. The housing has spirals cut on its internal surface which engage with the spirals on the sleeve. The bronze sleeve in addition to internal threads contains a number of straight key-ways. The steering ball lever which projects half way up into the sleeve has integral keys, so that when the sleeve is given rotative and longitudinal motion, it rotates the ball lever. The gear is provided with ball thrust bearings and an adjustment to take up wear, and can be made semi-irreversible or irreversible, depending upon the ratio of the threads.

Drag Links

In Fig. 5 is shown a type of drag link used on vehicles up to about 2 tons capacity. It has ball sockets which fit over the ball on the steering arm of the axle. One of the ball sockets is brazed or welded to the drag link tube and has an opening to receive another socket, which is retained by a nut or cap. The steering gear end has a housing attached to the tube which carries ball sockets and springs. These springs are introduced in the drag link to reduce the shock. The ball end may be introduced through holes in the housing and sockets or through slots which extend to the end of the housing.

The Vulcan drag link, Fig. 9, offers an example of the type used on heavy vehicles. This consists of a link of solid section threaded on both ends into housings which are divided on the ball center. The ball sockets on both ends are provided with cushion springs, while the caps of the housings are retained by long studs. This tends to facilitate assembling especially when the springs are heavy.

Some makers enclose these joints in leather boots, as shown in Fig. 5, to hold grease and prevent dirt and grit from cutting the ball surface.

As mentioned in the preceding chapter, universal joints are necessary at both ends of the drag link, because the steering arm moves in a vertical plane, and the knuckle arm in a horizontal plane, but instead of the ball and socket joints, forked joints are sometimes used. This type of joint was illustrated in Figs. 1-4 and 10 of the preceding chapter. They are somewhat simpler in construction and present larger bearing surfaces. However, they are more difficult to enclose and cannot take up wear automatically.

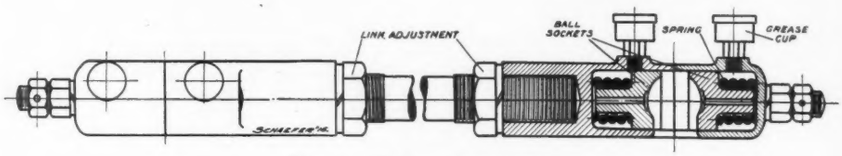

Fig. 9. Vulcan Drag Link
Ball and socket type, with shock-absorbing spring.

A Self-Dumping Truck for Building Operations

By GEO. W. GRUPP

A 5-ton self-dumping Atterbury has proved to be a successful experiment with the Iron City Lumber Co., of Youngstown, Ohio. The principal occupation of this truck is to make heavy long distant hauls, transferring their building equipment such as hoisting engines, concrete mixers, locomotive boilers, derricks, etc., from job to job. These hauls, which average about 30 miles over rough roads, amount to only one half the cost to ship by freight. This includes loading and unloading.

At the present time, the truck is engaged in hauling sand, gravel, cement, brick, stone, lumber, and coal, at Salem, Ohio. where they are doing construction work to the amount of $300,000. The distance of each haul is approximately 1¼ miles or 2½ miles round trip. This round trip, including loading and unloading, takes an average of twenty minutes. Working 10 hours a day, they make thirty trips and haul 150 tons (or three carloads of sand or gravel a day, as the average car of such material weighs 50 tons), at a cost of $10, and this amount includes interest and depreciation.

Upon estimating the cost of doing the same work with teams they found that it would require ten teams at $5 each, or $55 per day against $10. In short, they are saving $45 a day in making such hauls with a truck.

The Five-Ton Atterbury, Self-Dumping Truck

Owned by the Iron City Lumber Company, of Youngstown, Ohio. The photo was taken February, 1915. There is 10,500 lbs. on the truck, consisting of one locomotive boiler and 125 feet of stack, one section being hidden from view. The boiler was loaded at Goshen, Ohio, by the driver and helper in one hour. Hauled it to New Waterford, Ohio, a distance of 26 miles and unloaded in 18 minutes. This includes the time of taking off all bindings, and unloading in an upright position. Total time consumed from the time the truck left the garage until its return was 7½ hours.

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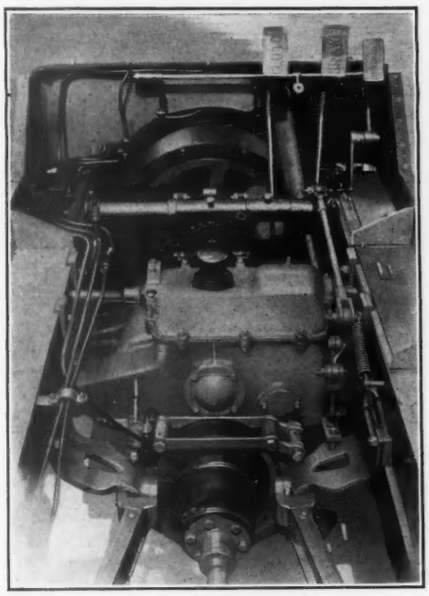
The G.V. Mercedes Heavy-Duty Truck

THIS five- to six-ton truck is made for very heavy duty by the General Vehicle Co., Inc., of Long Island City, N. Y. It has an engine rated at 35 brake h.p., four speeds forward, one reverse, with no direct drive, internal pinion drive. Tread is 60⅝ in., wheelbase, 169¼ in. Weight of chassis from 6434 to 7045 lbs. The speed is 10 m.p.h., and the truck can be turned in a circle approximately 51 ft. in diameter. The capacity load and body is 14,000 lbs.

Engine

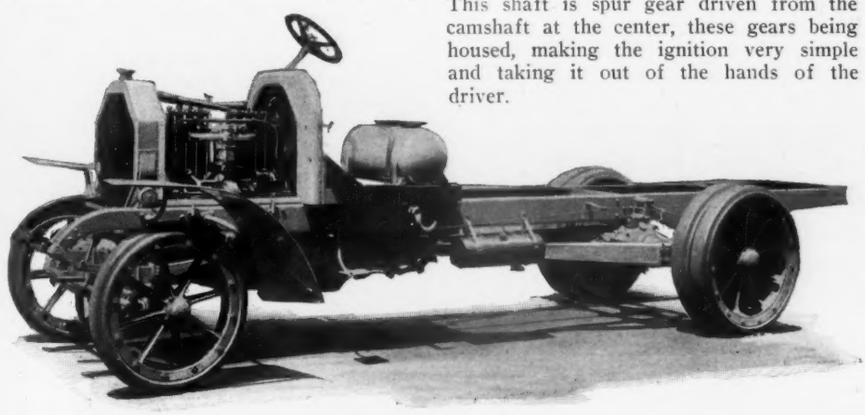
The power plant consists of a very tall valve-in-the-head type engine, with cylinders cast in pairs; bore, 4¼ in.; stroke, 5.9 in. Following the German method, the lower half of the crankcase is the main support of the engine, the front end being supported at a single point in the center on a channel section pressed steel cross member, while the rear is carried by integral arms of the case, which are bolted to hangers mounted on the side frame members. Aside from this crankcase arrangement, which is contrary to the usual custom in this country, there is nothing radical in the construction. The accessibility of the over head valve mechanism is a feature. The valve parts are held to the top of the cylinders by studs, and by simply depressing the valve end of the overhead rocker arms, the lift rods are freed, when the rocker arm can be swung out of the way and the valve and cage immediately removed, making these unusually accessible. The parts are noticeably staunch in construction, and of ample area and cross section. All parts are adjustable with lock nuts and every bearing or wearing surface, even though merely oscillating, is provided with a lubrication means. The spark plugs are inserted on an angle of 45 degrees in pockets in the side of the cylinders.

Ignition is by a Bosch DU4 magneto, with fixed spark, and mounted on the left on an integral bracket of the crankcase, and connected to the fanshaft by means of a Bosch adjustable magneto coupling. This shaft is spur gear driven from the camshaft at the center, these gears being housed, making the ignition very simple and taking it out of the hands of the driver.



G. V. Mercedes Truck

This illustration shows the universal joint, service brake drum, transmission case, clutch, and control pedals.



G. V. Mercedes Chassis

This view shows clearly the combined radius and torque arms, of heavy channel-section steel, the emergency brake cables, gasoline tank, etc.

Automatic Carburetor and Governor Control

Another feature of the construction is the throttle control. The intake manifold, which is of cast aluminum, carries on the upper side an enlargement of the housing, in which is an arm controlled by a lever the lower end of which is connected to a centrifugal governor at the front, and also to an accelerator pedal. The connection to the accelerator pedal is by a slotted end piece. The governor is set at 850 r.p.m. With the accelerator pedal in normal position, the engine speed is held down to approximately 300. Depressing the pedal, however, permits the governor to control the speed and the engine will speed up to the normal revolution, provided, of course, road and load conditions will permit. This control is effected by an arm in the housing of the intake manifold, which moves a simple cone shaped piece up and down, thus varying the area of the opening for the actual mixture, and also a sleeve which varies the proportion of auxiliary air, which does not pass over the nozzle.

After this is once set there are no adjustments. In other words, the carburetor is automatic.

Convenience Features

Many small features which make for convenience of operation are provided; for example, there is a draw-off pipe by which the bowl of the carburetor can be drained, the lower end of this pipe protruding below the sod pan. An overflow is also provided for the float chamber, with a pipe leading to the same point. The upper end of the float needle protrudes above the chamber and a flat steel spring can be swung over it, holding it firmly down, so that when the truck is left at night this precludes any possibility of carburetor flooding. A cross pipe passes between the cylinder castings and connects with a heater surrounding the exhaust manifold, thus providing warm air for the carburetor. A rotating sleeve, fitted with rectangular openings can be made to register with openings in the pipe, permitting more or less air to pass into the carburetor without heating, according to weather conditions.

Cooling System

A four-bladed aluminum fan of large diameter is mounted on an adjustable bracket on the front cylinder casting, with flat belt running over an aluminum pulley. The flywheel also carries fan blade spokes to assist in removing hot air.

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The radiator is built to Mercedes specifications and is mounted at each side on ball and socket supports on top of the side frame members. These sockets are provided with grease cups, as in fact are all points throughout the entire construction, wherever the slightest excuse for lubrication exists. The water circulation is maintained by a centrifugal pump, bronze housed and spur gear driven from the gear on the camshaft. This forces the water through copper piping and brass unions into the lower central portion of the twin cylinder castings. The water passes out at the top of the opposite side through tapered copper tubes to the top of the radiator.

The crankshaft is of chrome-nickel construction, cut from a solid slab, and is mounted in two long babbitt bushed bronze bearings, one at each end, and two short bearings of similar construction at the center, the gear which drives the magneto and pump shafts being mounted between these bearings.

The flywheel is mounted on an integral flywheel flange at the rear. The forward end of the crankcase protrudes, forming a partial housing for the governor, and has bolted to it the actual housing, which is also an aluminum casting, the forward end of which supports the starting crank. In this way the governor is effectively closed in, preventing the driver from tampering with it.

Connecting Rods

The connecting rods are the usual "I-" section drop forgings, bronze bushed at the upper end, having their bearing on hardened, hollow ground steel wrist pins. A set screw which penetrates the latter prevents side slip. Pistons are slightly domed at the head and carry three step cut eccentric rings. The valve lift rods are pushed by shorter rods with hardened steel rollers at the base, which contact with the cams and are prevented from turning by the protruding ends of the roller pins.

The camshaft is forged with cams integral and mounted in four bronze bearings. It is inserted through a capped hole at the front of the case. The gear at the center, which drives the magneto shaft, etc., fits on an integral taper of the camshaft, the hole in this gear being large enough to allow the cams to pass through it. It is, in turn, spur gear driven from the center of the crankshaft.

Engine Lubrication

A small plunger pump is connected by eccentric to a small shaft, worm driven from the pump shaft. This draws oil from the oil case sump, and forces it into the hollow crankshaft, where it is thrown out by centrifugal force forming a spray, which takes care of the pistons and connecting rod upper end bearings. There is no splash. The reservoir holds approximately 2 gals.

Self-Contained Clutch

The clutch is a self-contained member, with the leather-faced cone engaging on the backward motion. It is of pressed steel, the radiating spoke members being flat and twisted to form additional fan blades. When the clutch is pulled out, a flange on the clutch shaft is engaged, by two fiber pads held by looped flat springs forming a clutch brake. Although the clutch spring is fairly stiff, the clutch is easily held out of engagement, as the connection to the clutch ring is by a toggle joint, the arms of which come into alignment when the clutch is disengaged. The clutch diameter is 19⅝ in. maximum.

Transmission

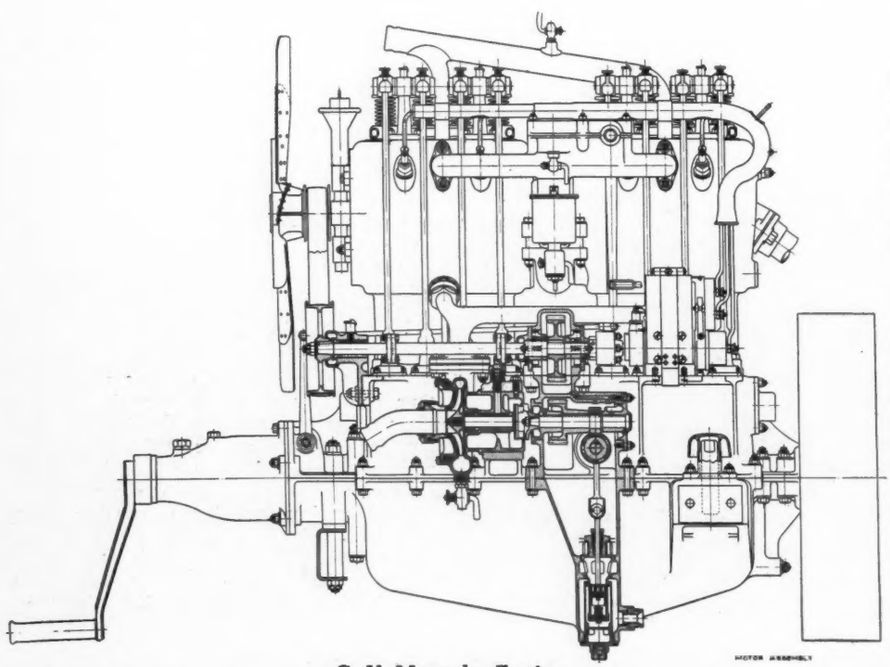
The transmission is of the sliding gear type, providing four speeds ahead and a reverse, without direct drive. In other words, the power enters the gear box on the clutch shaft and passes out on the driver or countershaft which is below. The upper shaft carries integral milled splines. The countershaft has integral webs to which are bolted ring gears. Both shafts are mounted on annular ball bearings, and are removable through the ends of the case, where caps protect from oil loss. The top of the case is removable and carries a cross shaft with the gear shifting lever, this being operated by the usual hand lever, at the right, operating in an H quadrant.

Water-Cooled Brake

At the rear of transmission case the lower shaft is fitted with a cast steel drum of 9 1/16 in. diameter., which is the service brake drum. Two shoes with cast iron lining close upon this drum by pedal action, giving a metal to metal brake. At the side of the chassis suspended by brackets from the side member is a copper tank for water. A pressure feed is provided from the engine's second cylinder, which puts a pressure, not only on this water tank, but also on the drawn steel 22-gal. gasoline tank mounted under the seat. A hand pump bolted to the dash is also provided for producing pressure when desired. By turning a small pet cock on the dash, water is forced from this water tank, dripping into a funnel with copper tube running from the dash to the service brake, thus providing cooling water. This can be so adjusted by the driver that just sufficient water drips into the brake drum to prevent overheating. This brake is adjustable by a star hand wheel, easily reached below the side frame member. A stiff spring prevents the adjustment from changing. The drive to the rear is by shaft and De Dion type universal joint with bronze plugs and steel pins, same being booted and packed with grease. The boot is held by hose clamps so that it can be readily removed.

Rear Axle and Internal Gear

The rear axle assembly consists of an internal gear drive using a drop forged "I-" section solid axle and mounted directly in front of it on heavy channel section pressed steel combined torque and radius rods, a regular jackshaft, at the ends of which are spur gears which mesh with internal gears on the wheels. These large internals are ring gears 22.99 pitch diameter. The spur pinions are mounted on integral splines on the ends of the jackshaft and are carried on annular ball bearings. They are entirely enclosed and packed in grease. The outside of the gear forms the drum for the emergency brake which is virtually two shoes, cast iron lined, pivoted at the front and lever contracted at the rear. Each of these shoes covers practically one-half of the drum. The brake is 24⅜x2⅜ in. These emergency brakes are controlled by the usual hand pull lever on the right with ratchet retainer, operating the brakes by steel cables running parallel to and outside the side frame members. The entire rear construction is unusual. The combined radius and torque rods of channel section pressed steel, being 7⅜ in. in depth at the widest part. These run forward and are swivelly mounted on drop forged brackets on a line with the center pin of



G. V. Mercedes Engine

This illustration of the engine used in this truck gives sectional view of water pump and oil pump. The governor is located next to the starting crank, at left

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the universal joint. A cross channel section member connects these torque arms, and carries the bearing of the rear end of the propeller shaft. The jackshaft itself is mounted throughout on annular ball bearings. Differential is of the bevel gear type, and wheels are mounted on roller bearings.

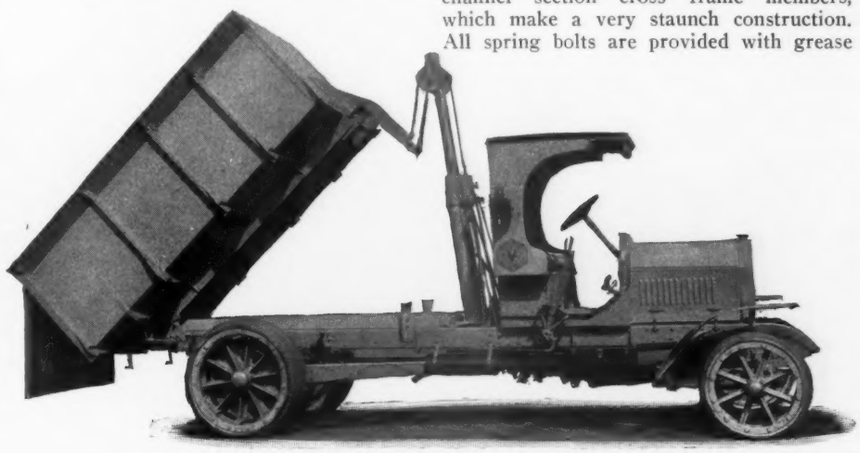
Wheels

The wheels, both front and rear, are of cast steel, with spokes webbed to the flanged rim designed after the S.A.E. standard. The front wheels carry 34x5 in. tires, while the rears are fitted with 40x6 in. duals. The front axle is also an "I-" section drop forging, with yoke ends.

The springs are mounted on integral seats, with U clips over the tops, castle nuts beneath. The steering pivots are somewhat unique in construction. The stub axle and the steering knuckle pins are all one piece, the upper part of the axle yoke is cut off so that after placing the lower part of the steering knuckle pin into its socket in the lower part of the yoke and swinging the top part into position it can be held by a cap over it bolted to the upper part of the yoke. The steering arms are connected by a cross connecting tubular link at the front of the axle. The drag link is also tubular. The steering gear is of the screw and nut type. A bell crank lever transmits the motion from the nut to the drag link. The end of this lever straddles the nut and operates in slots in each side in hardened steel washers embedded in the nut. Steering is by the usual hand wheel which surmounts a column protruding through the dash, regular touring car fashion, instead of being a vertical column from the floor. The only control on this wheel is a hand throttle and, as before mentioned, an accelerator pedal is also provided. The dash itself is of pressed steel and carries a sight oil by-pass which shows the driver whether the oil pump is properly working. There is also a grease cup with a screw handle to force grease to the water pump, this being merely a precaution, so that it is easy for the driver to take care of the pump bearings. The floor boards are also of pressed steel with projections on the surface and hinged so that they can be instantly swung up, making parts underneath accessible.

Springs

The front and rear springs are semi-elliptic, the front being carried on spring bolts at the front of the frame, and in shackles underneath the frame at the rear. These springs are 39⅜x2⅜ in. in length, ten leaves. The rear springs are also semi-elliptic shackled at both ends, 51 3/16x3½ in., thirteen leaves. The shackles are carried by drop forgings which are bolted, not only to the under side of the side frame members, but also to heavy pressed steel channel section cross frame members, which make a very staunch construction. All spring bolts are provided with grease cups and with free bronze bushings with holes countersunk on the inside and outside to distribute the lubricant. The rear springs are also mounted on top of the axle and held by "U" clips with the nuts on the top. The spring seats are swivelly mounted on the solid rear axle and an accessible outside oil cup and tube are provided for lubricating this surface.



G. V. Mercedes Truck

The body attached is of hydraulic hoist dump type. This is one of many uses the heavier trucks may be put to

Frame

The frame is of channel section, size 7 3/32x2⅜x5/16 in., pressed steel throughout. It is well cross braced and perfectly straight with side members slightly less in depth at the front and rear ends. The chassis comes without seat or rear guards. front guards, however, are provided. A heavy metal pan protects the entire under mechanism and is fitted with quick release clamps for easy removal.

Equipment includes three lamps, tool box, tools and horn.

THE NEW LITTLE GIANT SIX-WHEEL TRUCK

Industries having bulky or long but light loads to transport, frequently fail to realize the expected economies of motor truck transportation, owing to the very limited loading space which the ordinary chassis affords.

In the Little Giant Six-Wheel Truck, manufactured by the Chicago Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill., the engine is utilized to draw the load instead of carrying it and pushing it, with the result that efficiency of the power unit is greatly increased. In the six-wheel construction only sufficient of the load is placed upon the chassis of the truck to secure proper traction. But the weight so imposed is not rigidly fastened to the chassis but rests upon a ball race, making it a live or floating load. This feature naturally relieves the running gear and engine from the shock and strain which a load ordinarily transmits to a truck as a result of the constant vibration due to irregularities of roadbed, and also affords relief from strain in starting and stopping. This relief from the shock and strain is so great that the life of the engine is naturally increased.

In the Little Giant six-wheel construction, the rear wheels absolutely track and the driver need have no more concern for the movement and guidance of the load than in ordinary four-wheel construction. It is able to turn around in a 36-ft. space, even when carrying lumber 40 ft. long. As an example of its speed the truck made a trip from Philadelphia to Baltimore, 107 miles, including all stops, in 7 hours and 38 minutes.

The Little Giant six-wheel construction is of such a nature that anyone owning a Little Giant truck can purchase the additional outfit with all the apparatus necessary to complete the arrangement and easily apply it, thus making it possible by doubling the load space of the truck to double its carrying capacity.

The New Little Giant Six-Wheel Truck

This illustration shows the extra carrying capacity of the Little Giant truck of six-wheel type. The rear wheels track with the middle set of wheels, so that the driver need not pay attention to the rear end of the truck when turning corners.

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The New Studebaker Commercial Car

THE Studebaker Corp. of America, of Detroit, Mich., in announcing the 1916 model commercial cars, claim to have incorporated power, durability, efficiency, and beauty in them. The prices and details of the 1000-lb. commercial car will be described in the following paragraphs, the 1-ton models not yet having been announced.

The prices of the 1000-lb. commercial car with the bodies are as follows: Panel Body Type, $885; Express Model Type, $850; Combination Passenger and Express Type, $875; Chassis only, $785. Wheelbase is 112 in.

Engine

The cylinders, four in number, are "L-" head, cast in block, 3⅞-in. bore, 5-in. stroke. The engine is rated at 48 h.p. The crankshaft has three main bearings. Lubrication is by the circulating splash system, with four feed gear-driven pump. Cooling system includes a tubular radiator, a centrifugal four pump, and an 18-in. six-bladed fan.

Transmission

A cone type clutch with pressed steel cone is used with facing mounted on easy-engaging flat springs and ball bearing throw-out collar.

The transmission, mounted in unit with rear axle, has Timken bearings, chrome-nickel gears, with three speeds forward and one reverse. The gear ratio is 4.6 to 1.

Studebaker full floating rear axle is used with complete Timken bearing equipment.

Brakes

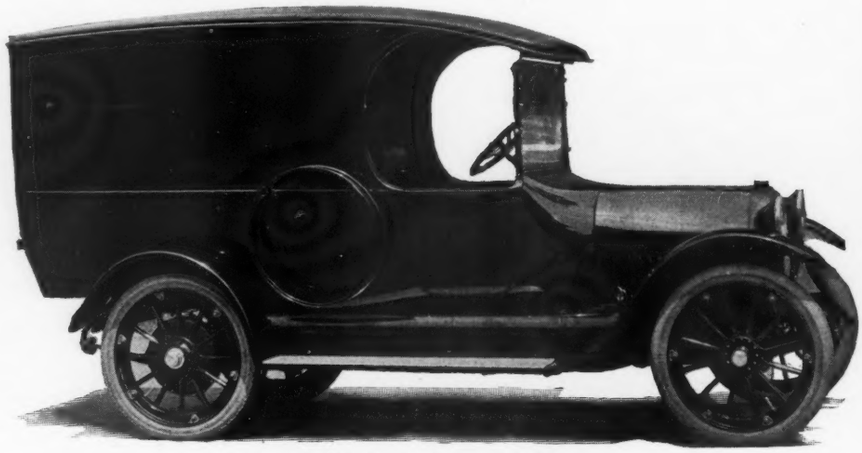
The service brake is operated from the foot-pedal and contracts on the brake-drum. The emergency brake is operated from a lever and is internal expanding on the brake-drum, which is 15x2 in. and Multibestos-faced. An improved equalizer is mounted on the transmission housing.

The irreversible steering gear is full worm and wheel type, ball bearing, and adjustable for wear.

Frame and Springs

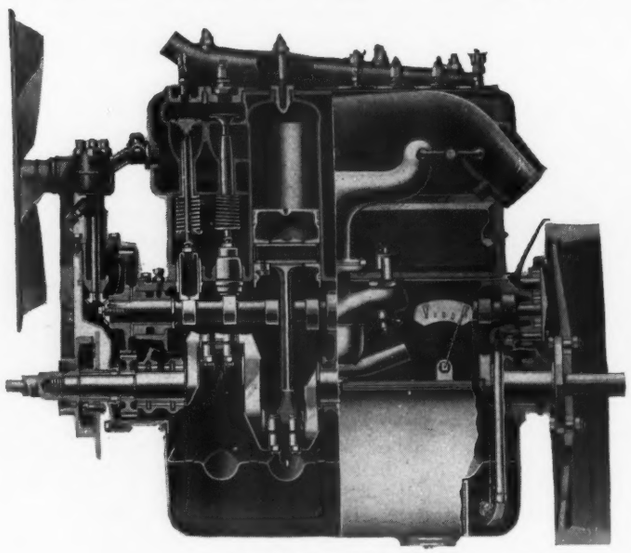
The frame channel is 4x1½x5-32 in. Frame overhang, 10 in. Fenders are heavy pressed steel, crowned, with concealed rivets.

Springs—rear are three quarter elliptic, size, 51x2 in., shackled at both ends. Front are semi-elliptic, 38x2 in., shackled at rear hanger. Spring eyes are bronze-bushed, with grease cups for lubricating; springs are relieved of all driving and torsional strain by two radius rods and torque arm.



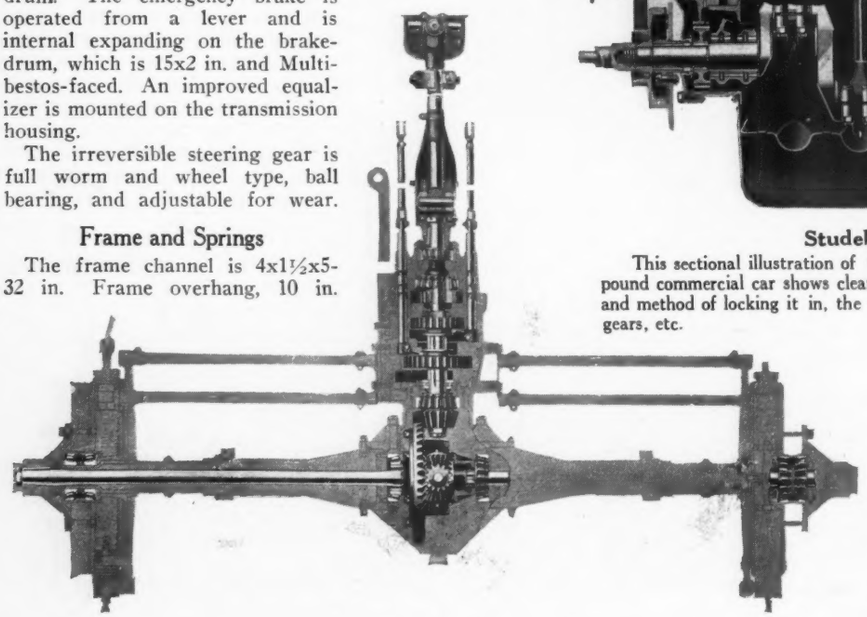
Studebaker Commercial Car

This right-side view of the one thousand pound commercial car gives a good idea of the car's lines, which are up-to-date and graceful. Tires carried on side



Studebaker Engine

This sectional illustration of the engine used in the one thousand pound commercial car shows clearly the four-ring piston, the piston pin and method of locking it in, the valve construction, the oil gage, timing gears, etc.



Studebaker Rear Axle and Transmission

This sectional illustration shows the full-floating axle, bevel differential gears, and transmission, fully equipped with Timken roller bearings

Wheels are of wood, artillery type with demountable rims, equipped with Goodrich 34x4-in. stright-side tires, safety tread on rear wheels.

Electric System

Generator-storage battery ignition is used, with Remy coil and distributer. Simplified one-wire system is used with wires carried on chassis in flexible metal conduits. The battery is 3-cell, 6-volt, 100-ampere-hour Willard, located under front seat.

This two-unit Studebaker-Wagner system used has generator mounted vertically at front of engine, and driven from helical

The CCJ leads in circulation, advertising and prestige

gear in mesh with crankshaft gear. Current control is automatic. The starting unit is located on right side of engine, engaging crankshaft through chain with over-running clutch.

Studebaker Commercial Car

View of one thousand pound commercial car, looking in from the rear end, showing the well protected sides and strong floor. Inside measurements, 40½ x 72 in.

All electric lights have separate switches located on cowl board. Headlights have dimmers.

Gasoline System

The gasoline tank located in cowl, feeds the 1¼-in. model R Schebler carburetor, located on left side of engine, by gravity. Heater, cast integral with exhaust manifold, supplies hot air to the carburetor.

The clutch and brake pedals are adjustable. Drive is left side, 18-in. steering wheel, center control. Finish is blue and black.

Equipment

Speedometer, gasoline gage, battery indicator, oil pressure gage, Sparton horn under hood, windshield.

The capacity is 1000 lbs., with space 40½x72 in.

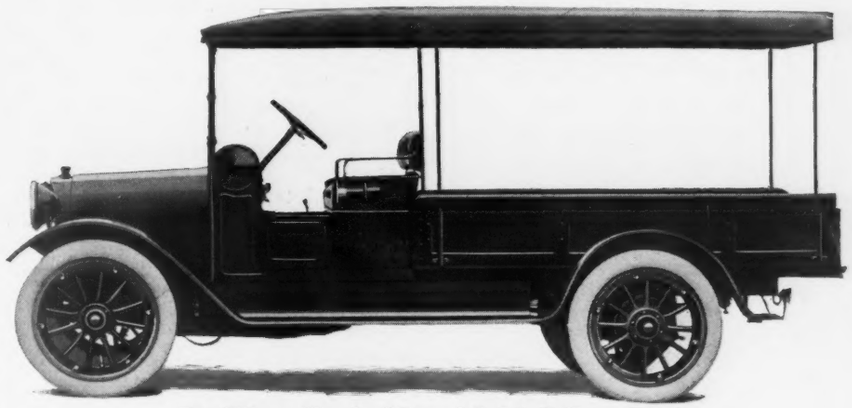
New Reo Model F Quick-Delivery Truck

This Reo Model F made by the Reo Mfg. Co., of Lansing, Mich., has a capacity of 1500 lbs., and a maximum capacity, including weight of body of 1800 lbs.

Engine

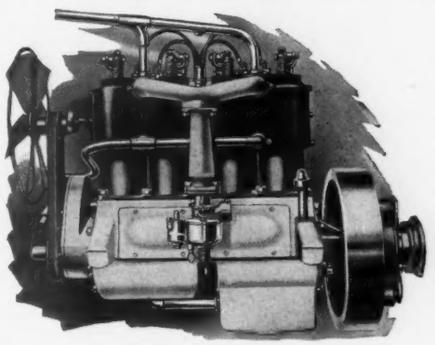
The engine rated at 35 h.p. has four cylinders, "F-"head type, cast in pairs, with heads integral, 4⅛-in. bore, 4½-in. stroke. Valves have a clear diameter of 1¾ in. A plunger oil pump forces oil to main bearings and timing gears. Cylinders are oiled by constant level splash. The connecting-rods are light, heat-treated "I-" section drop forgings, 9½ in. long, with high pressure babbitt bearing 1½x2¼ in.

Pistons are made from uniform grain cast iron, provided with two three-piece rings. The crankshaft is drop forged from manganese steel, heat-treated and ground. Main bearings are of nickel babbitt, front and center bearings being 1½x2¾ in., the rear being 1½x4 in., adjustable from the exterior of the crankcase. Cams are forged integral with camshaft, which is hardened and ground, and runs in a die-cast bearing. Timing gears are helically cut. The engine has four point suspension and is protected by a metal pan.



Reo Fifteen Hundred Pound Quick-Delivery Truck

This illustration shows the Reo truck of fifteen hundred pounds capacity, equipped with express body

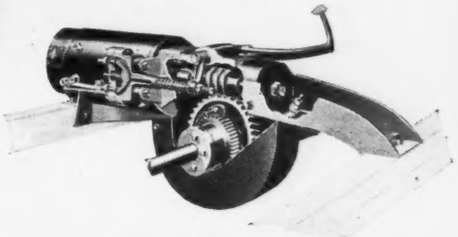


Reo Fifteen Hundred Pound Truck Engine

This view of the left side of the engine shows the overhead inlet valves. This engine has "T-" head cylinders.

Ignition

Ignition is by jump spark, current being supplied by a Remy generator, which also furnishes current to storage battery for electric lights and starting device.



Reo Truck Electric Starter

This starter motor is located over front end of transmission case and secures its current from the 100-ampere-hour storage battery.

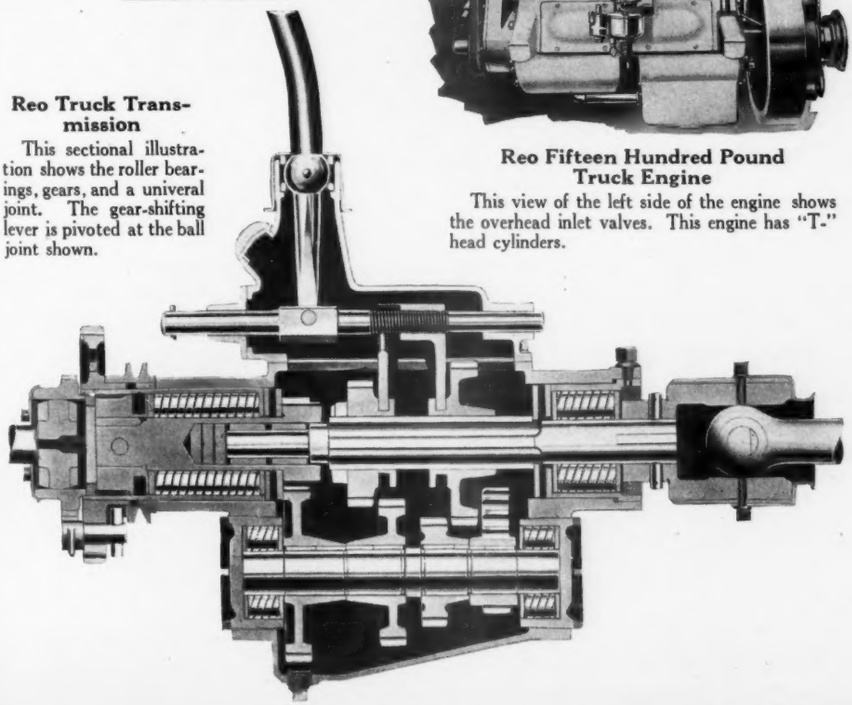
This Remy system is two-unit 6-volt, with 100 ampere-hour battery, with starting motor located over front end of transmission case. The two large parabolic headlights are fitted with a dimming device which saves current. A tail light and instrument light are also used.

Transmission

This is of the selective sliding gear type, with three speeds forward and one reverse. Gears are case hardened and have ⅞-in. face. Hyatt roller bearings are used

Reo Truck Transmission

This sectional illustration shows the roller bearings, gears, and a univeral joint. The gear-shifting lever is pivoted at the ball joint shown.



The CCJ has most advertisers because it gives them biggest returns

throughout. Center control of gear shifting. Dry disc type clutch is used, having thirteen plates.

Carburetor

This is the Johnson automatic float feed type, hot water jacketed, supplied with heated air, and with air control on dash. Throttle control from steering post and pedal accelerator.

The cooling system has positive water circulation by a gear driven centrifugal pump. A flat vertical tube radiator is used with outer casing which is easily removed if repairs are needed. Air circulation is by belt-driven fan and flywheel spokes.

The propeller-shaft is of heat-treated high-carbon steel, with two enclosed universal joints from transmission to bevel gears in rear axle. Standard gear ratios are high, 4 to 1; second speed, 7.2 to 1; low speed, 14.8 to 1; reverse, 20 to 1. The brake drums on rear wheels are 14x2¼ in. The service brake is contracting, and the emergency is internal expanding.

Axles

The front axle is drop forged "I-"beam section with integral yokes. Steering spindles are one-piece, drop-forged. Timken bearings are used.

The rear axle is full-floating type. Timken bearings are used for differential and rear wheels.

Steering Gear

This is located on the left side and is of the adjustable bevel pinion and sector type. Steering wheel is 17 in. in diameter. Turning radius is 22½ ft. Speed of truck is 22 m.p.h. Wheelbase, 120 in. and tread is 56 in. The gasoline tank capacity is 11 gal.; oil, 3 qts.; water, 3 gal.

Wheels and Springs

Wheels are artillery type of second growth hickory, with twelve spokes in each wheel. Demountable rims are fitted.

Springs are of high quality spring steel, semi-elliptic. All supports and shackles have grease cups. Front springs are 38x2 in., rear are 40x2¼ in.

Tires are pneumatic, 34x4½ in., nobby tread on rear wheels.

Body and Equipment

Standard body is the express type, flare board with top and side curtains. Inside measurements, 44x96 in.

Equipment includes Remy starting and lighting system, storage battery, four lights, speedometer, ammeter, mechanical horn, windshield, tools, tire pump and jack.

Price with body, canopy top, $1075 f.o.b. Lansing, Mich. Price including complete equipment minus body, driver's seat, canopy top and windshield, $1000 f.o.b. Lansing, Mich.

'BUS SERVICE IN CALIFORNIA

By A. A. WILLOUGHBY

The Peninsula Rapid Transit Co. operates a fleet of motor 'buses between San Francisco and San Mateo, a distance of 20 miles. It operates in competition with a steam railroad and an electric interurban line, yet has proved a dividend payer from the start. White chasses of 1½ ton capacity were used in connection with a specially designed passenger coach body.

The body is 17 ft. long and 7½ ft. wide, inside dimensions, with a partitioned-off space 5 ft. long for the driver's seat and a smoking compartment, and has a seating capacity of twenty-four. Machine buffed Spanish leather is used for the upholstery. The interior is electrically lighted and is heated and ventilated by a unique system. The exhaust pipe is "stoved" for a distance of 2 in. from the muffler neck, and the indrawn air through this stove is carried to a grate in the floor of the car. This furnishes adequate heat. Push button signals are used. Passengers drop their fare on leaving in a box adjacent to the driver. Entrance and exit is by a single door at the front end.

The average cost of operation per day of one of the cars is as follows:

Gasoline, 20 gals. at $.10	$2.00
Tires, 230 miles at $.03 c.p.m.	6.90
Oil, 1 gal. at $.30	.30
Drivers' wages, 9 hours at $.40	3.60
	$12.80

Gasoline is figured at 11 miles per gallon, oil at 230 miles per gallon. Tires form the heaviest item of upkeep. No administration costs are figured in, as they vary. Depreciation is charged off at 20 per cent. per year. Six cars are regularly on the road, maintaining a schedule of a trip every 30 minutes from terminals. There is one spare car and two for private party work and for rush hours, making a total of nine cars now in service. Several more will be added later.

Contrary to the hue and cry by the railroads that motor 'buses do not create any new traffic, operations of this company have shown that new business is developed. More than four hundred strangers were counted one day using the 'buses and a number of new residents have been gained for San Mateo since the establishment of the line. The fare one way by steam railroad is $.55, with a round trip rate of $.75. The electric line, which is operated by the San Francisco city system, charges $.25 one way, with transfer privileges in San Francisco. The 'bus fare is $.25 one way, but books of tickets are issued and school children's half-fare rates also prevail.

Main Room and Smoking Room
Interior views of one of the Peninsular Rapid Transit 'buses. The chassis is a White

Side View of the San Francisco—San Mateo 'Bus
Body is 17 ft. long and 7½ ft. wide, inside dimensions. The seating capacity is twenty-four persons

With the exception of strips of cobblestone pavement in San Francisco, new asphalt pavement is found the entire way, which adds greatly to the comfort of the trip and to the life of the cars. As soon as a new cut-off is completed in San Francisco, the route will be shortened 3 miles and better running time can be maintained. At present a trip consumes an hour and ten minutes one way.

The line was promoted and put in operation by C. O. Ellingwood, who had established a similar line in Tacoma, Wash. He acted as its manager up to the 1st of August, at which time he resigned to start a new company near Los Angeles. A. P. Mills succeeds him. The San Mateo County Development Association has been active in developing trade for the line and originated the idea of having the 'bus line. Outside of the San Francisco city limits there is a population of 18,000 directly tributary to the line.

The CCJ has most readers because it gives most information

The Municipal Automobile in Britain

By OUR FOREIGN CORRESPONDENT

AT the National Road Conference, recently held in London, the automobile came in for a good deal of attention, and some instructive opinions were obtained from borough engineers and surveyors, who are actually using this form of power.

Mr. Ernest J. Elford, borough engineer, Southend-on-Sea, is one of these with experience in gasoline, electric, and steam driven cars. Speaking broadly on the economic factors that apply alike to all types Mr. Elford is very strongly in favor of facilities for rapid loading and discharging, in the reduction to a minimum of repairs (and consequently lost work days), of the working of automobiles in as large groups as possible, and of the use of solid rubber tires on interchangeable wheels.

Truck Loading and Discharging

The stress that Mr. Elford laid on loading and discharging facilities is all to the good, and the matter calls for attention in England, where all such facilities have hitherto been designed for horse-drawn traffic, for which delays are actually desirable for resting and refreshing the horses.

When Should a Car Be Scrapped?

In recommending a car that involves the minimum of repairs a nice point was raised as to when it pays to scrap a machine, and Mr. Elford suggested with good reasons that in many cases it would pay to scrap old vehicles long before they had ceased to be doing work, and long before they were ordinarily scrapped in actual fact.

Apart from the advantages of purchasing stores more wholesale when several wagons are running, shorter terminal delays are possible when large loading and unloading gangs can be employed, to say nothing of reduced cost of repairs.

Experience With Electrics

The corporation of Mr. Elford's municipality has for some months been running an electric in competition with gasoline omnibuses, with the result that the electrical engineer's report is very favorable to the former, which is a single decked car with twenty-two passenger seat accommodation and weighing 4.05 tons. Experience so far indicates that the electric service will cost 10 to 15 per cent. less per mile than the gasoline 'buses, the former showing a greater consumption at the rate of 1.56 units a mile.

Water Tank Wagons

The Southend people use steam wagons for their larger tanks above 600 gallons capacity. These larger tanks are rectangular, the smaller ones below 600 gallons mark are cylindrical, and mounted on 3-ton gasoline chassis.

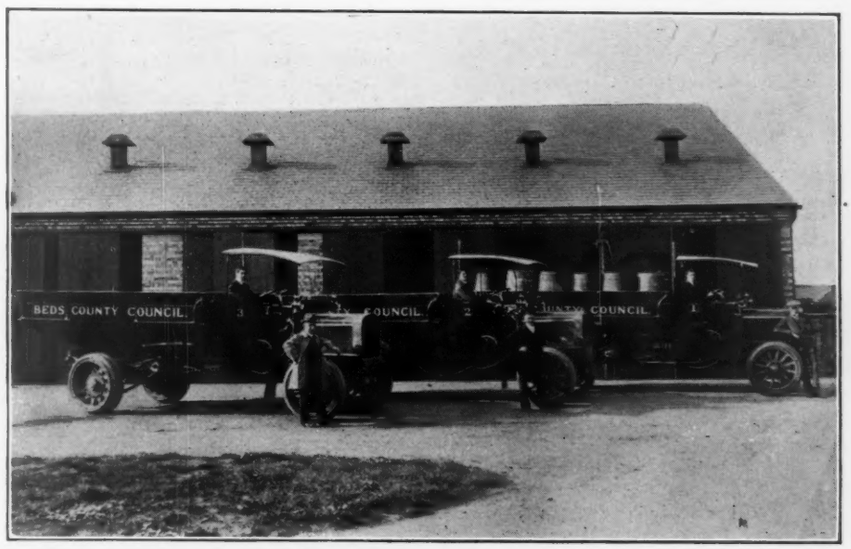
Great stress is laid on the possibilities of using interchangeable bodies to render the chassis available for the different purposes of municipal requirements, and when the tanks have thus to be interchangeable. the water tank should be provided with spreaders, while the operating gear should be self-contained with the tank and may be controllable by the foot, so that watering and driving can be done by one man. Spreaders of box type are most convenient.

Under these circumstances, in general, the Southend municipal vehicles favor rubber tires, though it is sometimes found advantageous to keep interchangeable wheels, one set with rubber, the other with steel tires; the former for summer use on good roads, the latter for winter. For the 3-ton chassis they pay $.035 per car mile per set of six tires (singles on front, twins on back wheels), which arrangement has been found to compare satisfactorily with the purchase of tires outright, with less fluctuation in the annual accounts. The cost of working the gasoline vehicles per day is as follows:

Weight unladen, 3 tons; load, 3 tons (630 gallons of water); average day's work, fourteen loads, equal 84,000 lbs. average; daily mileage, 38; working days per annum, 170; cost of car without tires, 525 lbs.

Petrol Vehicles Adapted for Street Watering and Sewer Flushing Only

Capital charges (loan repayment and interest)	$1.92
Depreciation (additional to above)	.24
Wages (driver 6s. 6d., mate 4s.)	2.60
Insurance, rent, etc.	.36
Oil, waste, etc.	.18
Petrol (six miles to a gallon at 1s. 7d.)	2.36
Repairs, etc.	.36
Tires (rubber at 1¾d. per car mile)	1.28
Total cost per working day	$9.30



The Three 3-Ton Commer Cars
That have been so successfully used by the Bedfordshire County Council, in England

Mr. F. W. Smart, chief assistant to the county surveyor of Bedfordshire, also gave some instructive experiences. The town of Bedfordshire is practically in the middle of the county, and in that county are 735 miles of main roads to be maintained by the County Council. For that purpose a tar-macadam plant was started on April 1, 1912, with an annual output of 12,000 tons. Some means had to be provided for the convenience of this material, so after consideration the County Council purchased three 36-40 gasoline rollers from Commercial Cars, Ltd., of Luton,

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Bed's. These cars have, up to date, travelled 39,284, 28,824, and 29,944 miles, and have carried 11,617, 13,192, and 9599 tons respectively. Here are the details:

Number of Lorry.	WORKING HOURS. Loading.	Outward Journeys.	Unloading.	Inward Journeys.	Total.	Mileage Covered.	Number of Loads Carted.	Weights of Loads Carted. Tons.	Cwt.
1	959	620	389	578	2546	14,123	946	4771	9
2	1075	539	461	482	2557	9,049	1109	5544	3
3	977	579	386	539	2481	12,024	1009	5063	13
	3011	1738	1236	1599	7584	35,196	3064	15,379	5

The lorries used for this purpose carry a load of 5 tons in an end-tipping body worked by hand gear on either side. Each vehicle inclusive of all fittings costs £722 3s. 4d. (About $3460).

Here are some details of their working costs:

MATERIALS. Petrol.	Motor Engine Oil.	Gear Oil.	Waste.	Cloths.	Common Oil.	Paraffin Oil.	Grease.	Carbide.	Cost of Labour Materials, Tires, Spare, etc. £	s.	d.	Depreciation on Capital £	s.	d.	Total. £	s.	d.	Cost per ton-mile.	Cost per working hour.
gal.	gal.	gal.	1s.	1s.	gal.	gal.	lbs.	lbs.			d.			d.			d.	d.	d.
2546	128	31	2	18	6	8	139	20	394	4	10	105	15	7	500	0	7	3.37	47.1
1890	121	31	..	14	1	11	76	21	351	10	0	105	15	9	457	5	9	4.85	42.9
2256	130	19	7	19	8	8	66	27	384	5	6	105	15	9	490	1	3	3.90	47.8
6692	379	81	9	51	15	27	281	68	1130	0	4	317	7	3	1447	7	7	3.93	45.8

* We are obliged to give the figures in British currency, but the most essential figures —the cost per ton-mile and per hour—average $.0702 per American ton-mile, and $1.42 per working hour.

The total cost of £1130, 0s. 4d is made up as follows:

Gasoline and lubricator (gasoline at 5.26 miles to the gallon)	£461.1.7.
Tires at 1.63d. a mile	239.10.0.
Driver's wages	232.0.10.
Depot and establishment charges	63.19.4.
Insurance	45.0.0.
Spare parts	33.7.5.
Labor for repairs (exclusive of driver's time)	27.8.6.
Sundries	27.12.8.

Depreciation is written off at the rate of 1-7 of the total cost each year.

Over Fifty Per Cent Saving

Apart from the great convenience to the County Council of being able to do their own transporting, the use of these automobile trucks has proved very economical. Some of the material has to be carried 3 miles from the nearest railway depot, and the lowest cartage tender is $1.32 a ton, while the cartage contractor frequently has only one team available. If, say, 200 tons of material were required, the cartage cost by horse would be approximately $275. With one motor truck daily and two men for loading and discharging, 20 tons can daily be taken at a total cost of $110.40 for the whole 200 tons; or at less than half the cost of horse haulage. These figures are based on 45.8d. an hour plus 6/ a day for two men on a mileage basis. Broadly speaking, the automobile has been found to work out at 3.93d. compared with from 6 to 8d. a ton mile by horse traction.

Another Big Economy: One Truck= 4.12 Horses

The municipality that has had the longest experience with motor trucks is probably that of Chelsea, which has now used them for 15 years. Their experience shows that one motor truck does work equal to that of 4.12 horses, and while the cost by motor truck works out to 2s. 9.28d. (approximately $.34), hired horses cost 3s. 4.99d. (approximately $.82), and by the Council's own horses 3s. 10.12d. (just over $.92). The truck thus shows a saving of 18.46 per cent. over hired horse work, 27.51 per cent. less than the Council's own horses, and this without taking into account the greater distances that can be traveled by the auto trucks, to say nothing of their tirelessness.

'BUSES AS AIDS TO MUNICIPAL TRAMWAYS

Working Costs at Sheffield

For a long time past the Sheffield Corporation has run motor omnibuses to extend those of its lines where the traffic does not justify the cost of tramways, and to feed by branch services others of its lines. With this in view they have produced a scheme by which all tramway lines running into the city should be fed by motor omnibuses, and by now, with the exception of a single line, that scheme has been completed.

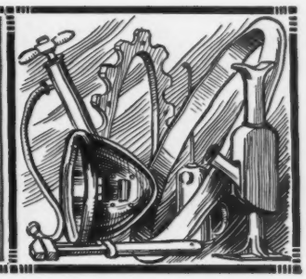
The writer has just seen their accounts for the year, March 25, 1914 to 1915, in which the figures are so carefully worked out that we are giving the results in English currency, merely asking our readers to remember that a penny is roughly the equivalent of $.02.

Average Per 'Bus Mile	Pence
Superintendence	.014
Wages of Drivers and Conductors	2.184
Wages of other Traffic Employes	.088
Cleaning and Oiling 'Buses	.431
Depot Expenses	.049
Ticket Check	.064
Uniforms and Badges	.118
Miscellaneous:—	
Meals for Drivers etc.	
Omnibus Licenses	
Destination Boards Etc.	.064
To General Expenses:—	3.012
Salaries of General Officers and Staff	.132
Head Office Upkeep	.019
Store Expenses	.026
Rent, Rates, and Taxes	.050
Printing Stationery, and Advertising	.070
Fire Insurance	.011
Insurance Fund—proportion transferred to meet Third Party Claims	.027
Workmen's Compensation Fund—Amount Transferred	.012
Employers' Contribution to National Insurance	.018
Miscellaneous—Disbursements, etc.	.005
To Repair Account:—	.370
Chassis	.844
Bodies	.201
Wheels and Tires	.786
Workshop Tools and Sundry Plant	.015
Building and Fixtures	.043
Miscellaneous	.026
To Road Maintenance Account:—	1.915
Sundry Authorities—Mileage	.055
To Power Expenses:—	
Petrol	1.683
Amount of Working Expenses	7.035
Balance carried to Net Revenue Account	3.436
	10.471

British Double-Deckers
Showing the type of omnibus used by the Sheffield Corporation Tramways to develop their tramway services

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

TRUCK ACCESSORIES AND APPLIANCES



SPRING OILER STRAP

The Leather Tire Goods Co., of Niagara Falls, N. Y., has recently brought out a spring oiler which consists of a strap having wicking on the inside, designed to be buckled around the spring just inside the clip which holds the leather together. This is the point where there is most motion between the leaves, and the oil from the wicking works between the leaves when they are in motion, keeping them lubricated, making the springs ride easier and less liable to be broken.

Spring Oiler Strap

The wicking is saturated with oil when the strap is buckled on, and has a hole in the top with a leather cover over it through which the oil can easily be squirted with the can when one is oiling the car.

These Spring Oiler Straps have the advantage of being adjustable so that one size will fit all cars. They are unbreakable; are very easy to put on; sell at $.25 each. A Ford commercial would require only four, while from eight to sixteen are required for larger trucks, making a full set for a Ford cost only $1. Other cars require from eight to sixteen, according to the type of springs.

"BOUND BROOK" OIL-LESS BEARINGS AND GRAPHITE-LINED BUSHINGS

The Graphite Lubricating Co., Bound Brook, N. J., has been specializing in this type of bearing for over 25 years and its product is extensively used and well known in railroad shops, ship yards, electrical machinery, large manufacturing plants, and especially in places where lubricating of bearings is impractical.

This company calls particular attention to its product for use on trucks. It does not carry bearings in stock, but makes up bearings special for each individual requirement.

The "Nigrum Bearing" is a wood bearing which is thoroughly impregnated with graphite making oiling absolutely unnecessary. This type of bearing is recommended for use in the spring eye, as a fan bearing and in all cases where high speed is essential.

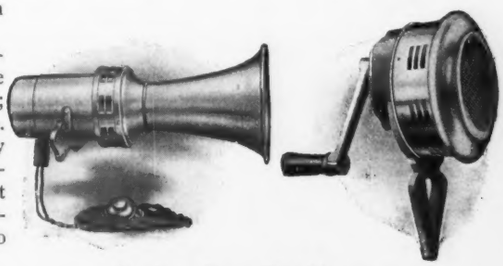
The "Bound Brook" bushings, bearings and washers are made of a special mixture bronze especially adapted to the purpose of manufacturing an oil-less bearing. The recesses in the bearing are filled with the best lubricating graphite. The graphite and bronze surfaces are flush, wear evenly, and require no refilling.

The maker claims that no speed is too high for its oil-less bearings. As an example of this, attention is called to a bearing made for use in steam turbines which make 25,000 r.p.m. and which are entirely successful.

STERLING SIREN FIRE HORNS

The horns herewith illustrated are made by the Inter-State Machine Co., of Rochester, N. Y.

The electric siren, price $35, has 10 ft. of double-twisted insulated cable with terminals, water-proof switch, and screws for mounting to dash on running board. The mechanism includes a small high-speed motor enclosed in water and dust-proof housing. A 4-in. aluminum fan, or rotor, is mounted on motor armature shaft, and when the motor operates at high speed the air, cut off through air ports in housing, produces the far-reaching siren note. Bearings are packed with grease. Corners in black and nickel finish.



Sterling Siren Fire Horns

The left illustration shows the Sterling Electric Siren fire horn; the right is the hand-operated Siren.

The hand-operated model, known as Type H, has rotor 7 in. in diameter, and is operated by a chain of case-hardened gears, running on steel balls. These are completely enclosed. The price is $35. The operating handle can be revolved or oscillated by means of a simple friction clutch.

Both of these models are made exclusively for fire trucks.

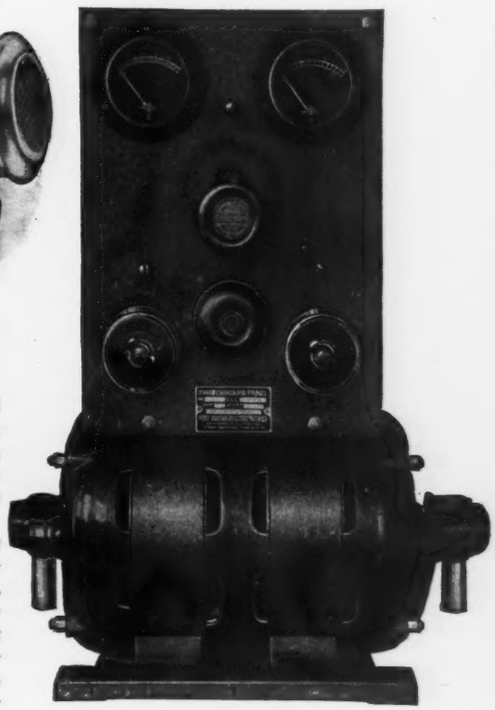
BOSCH MAGNETOS have been adopted as standard equipment on trucks made by the Sandow Truck Mfg. Co., Chicago, Ill., and the Sterling Motor Truck Co., Milwaukee, Wis.

THE FORT WAYNE BATTERY-CHARGING OUTFITS

Fort Wayne battery charging outfits are designed especially for service in garages for charging automobile ignition and lighting batteries. These outfits consist of small motor-generator sets on which are mounted small switchboard panels bearing all the switches, instruments, etc., necessary for their control. They are to be connected to the incandescent lighting circuits by means of lamp cord and plug, the motor-generators being supplied for service on 110 or 220 volt, 60 cycle, alternating current circuits, or on 110 or 220 volt, direct current circuits.

The motor-generators are supplied to deliver direct current at 12, 18 or 24 volts, such voltages being specifically adapted for charging 12, 18 or 24 volt batteries.

The switchboards, which are mounted upon these sets, have a snap switch in the line circuit for the purpose of starting and stopping the sets; a snap switch in the circuit from the generator to the batteries to be charged, for opening the charging circuit; a voltmeter for reading the voltage delivered by the generator; an ammeter for reading the charging current; and a field rheostat for raising or lowering the voltage of the generator end of the set and, there-



The Fort Wayne Outfit

fore, serving to adjust the battery charging current. A small push button switch placed in the center of the board between the two snap switches before mentioned, is provided so that the voltmeter is not in circuit except when it is desired to read the voltage delivered by the set. The rheostat provided on the switchboard in all cases has sufficient capacity to reduce the voltage of the set to that proper for charging a battery of any lower voltage down to and including a 6-volt battery.

These battery charging outfits are so small that they may be placed at any convenient point in the garage, and when placed upon a work bench they will take up but very little room. They need practically no attention in service other than an occasional filling of the bearing cups with oil. The switchboard, bearing all of the instruments, rheostats, switches, etc., properly wired leaves as the whole work of installation, simply the necessity of connecting to lighting circuit and to battery by lamp cord. The outfits are supplied in two capacities, 175 and 250 watts output, such capacities having been found specifically adapted to the service of charging automobile ignition and lighting batteries. The outfits are manufactured by the Fort Wayne Electric Works of General Electric Co., Fort Wayne, Ind.

A REAMER FOR ENGINE CRANKSHAFT WORK

"Scraping in" the crankshaft bearing of engines is well known to be a long, tedious job and frequently not producing a smooth running engine even after the job has been completed.

A tool called the Martell Aligning Reamer has recently been developed by the Harding Manufacturing Co., 40 Court Street, Boston, Mass., by which it is possible to bore out crankshaft bearings in one-quarter the time required for hand scraping and in a far superior way. This new mechanical method insures perfect gear mesh, accurate alignment of the bearings, bores them to exact size and leaves a burnished surface. The reamer equipment for standard sizes of crankshaft bearings from 1⅝ in. to 2¼ in. consists of the following:

1 Long Aligning Reamer Shaft; 2 Reamer Heads—Large and Small; 6 Adjustable Supporting Bushings; 6 Sets of Blades—6 Blades to each set; 1 Short Aligning Shaft—for connecting rod work; Spanner wrenches, crankshaft gear-bushings, etc.

For engines having smaller bearings than included in the range of the above equipment, a special set for bearings from 1¼ in. to 1⅝ in. is made, including the following:

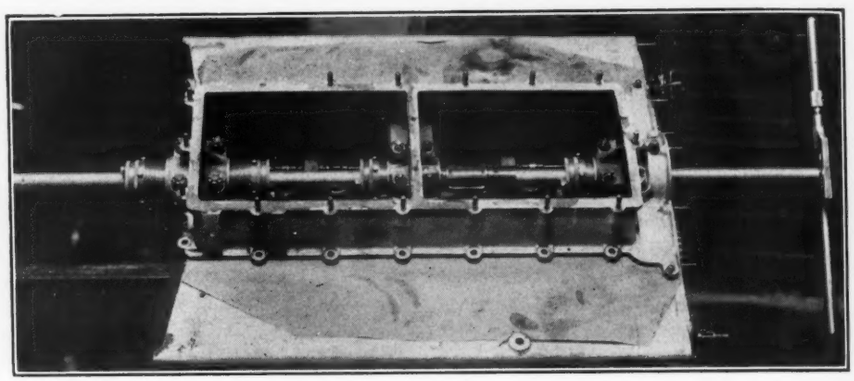
1 Long Aligning Reamer Shaft; 1 Reamer Head; 5 Adjustable Supporting Bushings; 3 Sets of Blades—6 Blades to each set; 1 Short Shaft for connecting rod work; Spanner wrenches, etc.

The engine may be set up on horses, or, with some types the work may be done without removing the engine from the chassis. The crankshaft is calipered and the reamer head accurately set to the proper size with a micrometer, making due allowance for oil clearance.

The reamer shaft is supported by the eccentric bushings secured in a tapered sleeve having fine threads on the tapered portions. These are screwed securely into the ends of the bearings or holes to be reamed or bored. The eccentric bushings are provided with flanges, on the faces of which are Vernier scales reading in thousandths of an inch and recording the amount and direction of motion of the reamer shaft. The crankshaft gear is then mounted on the reamer shaft by means of the special bushings. The adjustable bushing may be manipulated until the gears mesh perfectly, after which the other bushings are aligned in their respective bearings by means of the adjustment. It is then an easy matter to ream the bearings in turn, removing the successive bushings as they are reached by the reamer. The resultant bearings are necessarily in perfect alignment, are of just the right size, and the smooth, burnished surface left by the reamer gives a longer life to the bearing than can be obtained by the practice of hand-scraping.

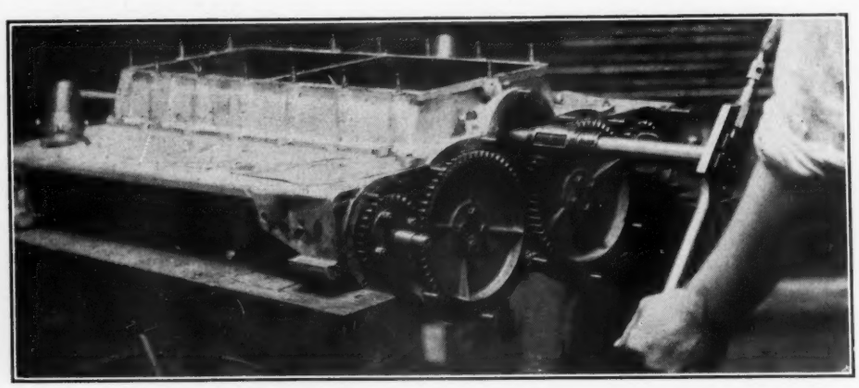
An additional feature of the reamer equipment is the short shaft by which the connecting rod bearings may be quickly reamed out.

This equipment is of value not only to garages, repair shops, and service stations, but can be used to great advantage by companies operating fleets of motor trucks and making their own repairs. A booklet describing in detail this method of reaming bearings may be had on application to the Harding Mfg. Co.



The Martell Aligning Reamer

Reamer set up in engine, ready to ream bearing No. 2. Note adjustable bushings by which shaft is aligned and gear mesh secured



The Martell Aligning Reamer

Reaming first bearing. Reamer head has been set by micrometer to exact size. Aligning shaft has been located by special bushing, so that crankshaft gear will mesh perfectly

PACKARD ARMORED CABLE

The Packard Electric Company, of Warren, Ohio, is introducing a new ignition cable which is destined to become popular with the truck makers, inasmuch as it is built for hard service.

The illustration clearly shows the construction of this new cable. The core consists of strands of soft-drawn turned copper wire laid in reverse layers, making the core flexible and round in cross section. The insulating cover is made in three styles, determined by limitation of diameter and the service required of the cable. Over the insulating material is placed a layer of braid which, being tightly woven, furnishes a partial armor against abrasion and also serves as a web to carry the enamel. The cable is now given a special treatment with successive coats of enamel which seals in all the insulating material. The cable is then wound with a close fitting all-metal covering which armors the cable and at the same time leaves it flexible. Brass, plain or nickel is used, also a special rust-proof steel. The cable is made in various sizes and styles of insulating material.

The Packard Armored Cable

The metal covering makes for hard service

The CCJ has most advertisers because it gives them biggest returns

VALVE GRINDER FOR FORD DELIVERY CAR

The Auto Parts Co., Providence, R. I., which specializes in tools and accessories for the Ford car, has brought out a new valve grinder for the Ford delivery car. One of the features of the new tool is that

The Apco Valve Grinder

the correct amount of pressure is provided by the weight of the grinder which is rotated by the fingers. A universal joint compensates for any variation from vertical. The maker states that the valves of the fourth cylinder are as easily reached as those of the first. The tool comes finished in black enamel and sells for $.20.

THE CORNFIELD RESILIENT WHEEL

The latest type of motor truck wheel which depends upon springs for its resilient qualities, is the Cornfield, built by the Cornfield Resilient Wheel Co., Inc., New York American Building. 58th St. and Broadway, New York City.

In the design of this wheel that portion of the space which in an ordinary wheel is enclosed by the felloe, consists actually of a non-revolving and non-volvable floating hub, the central block of which rests on helical springs at the top, bottom and sides.

The block cannot be displaced from the plane of rotation. The springs rest one end in the block and the other seated in

The Cornfield Resilient Wheel

The initial parts of this wheel are here illustrated. The rollers are in plain view, as are also the vertical and horizontal springs.

cups, which are in turn integral parts of sliding washers resting on the spring support. The block is in the form of a cross, the arms of which pass through the spring washers and reach between and through the spring supports, thus maintaining the wheel rigidly in the plane of rotation and allowing only the horizontal and vertical deflection of the springs in that plane. The springs are compressed to a ratio that under various carrying load or road conditions prevents any of them from becoming fully relaxed.

Sudden resistance or shock received on the tire and delivered to the springs will cause the housing to move in a vertical or horizontal direction, causing temporary eccentricity. These changes will favor over-riding obstacles, because as the lower springs deflect, the center of the housing will rise above the center line of the block, and when they recoil it will cause the upper springs to deflect, thus dropping the center of the housing below the center line of the block. This will prevent the wheel from being pulled from the road and thus will reduce skidding and hammering.

Similarly, when the clutch is thrown in, the horizontal backsprings will compress, taking practically all the shock, the engine sustaining but a soft pull. On the other hand, when the brake is used for a quick stop all the shock will be taken up by the horizontal front springs.

NEW HEAT-TREATING FURNACE

Only One of Its Kind in the World

To insure a continuous and absolutely even high temperature in heat treating commercial car springs, the Detroit Steel Products Co. has just installed a mammoth new oil burning rotary furnace in its plant at Detroit, Mich. The furnace, which was designed and built by the plant engineer, has the general appearance of a big mushroom with the stem cut off. It is 26 ft. in diameter, 61.7 ft. in circumference, and is the only furnace of its kind in existence.

Operated by electricity, the floor revolves, making one complete revolution in from 20 to 30 minutes. The speed, however, can be regulated by a variable speed motor.

Jets of air and fuel oil placed at intervals around the outside circumference, shoot into the furnace at a great velocity through vents left in the walls. The oil is ignited through contact with the heated interior of the furnace keeping its temperature at a height of from 1450 degrees to 1575 degrees Fahrenheit. Ten pyrometer couples register the temperature, and an electric signal board notifies the operator when temperature threatens to get too high or too low. This enables the operator to keep the furnace at an even temperature.

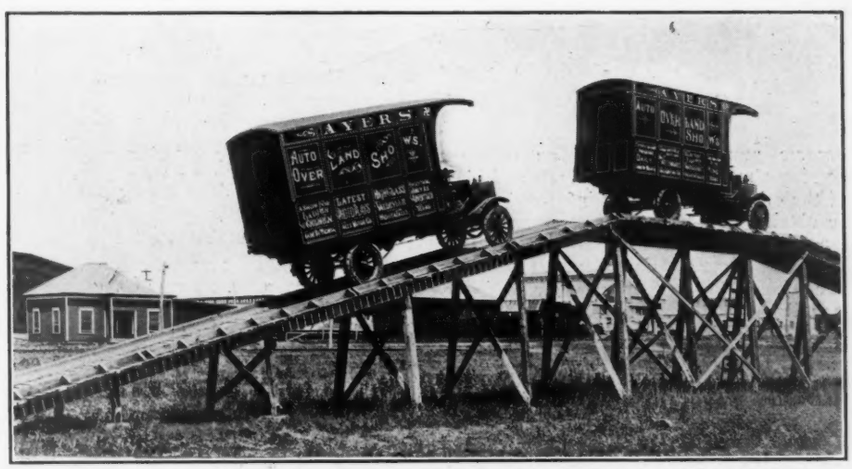
To treat a large outfit of springs in the old type of furnace, it was necessary to heat the furnace to a considerably lighter temperature than that desired for the springs themselves. The steel was brought to the required temperature quickly and removed before it became too hot. The rotary furnace is heated only to the temperature required in the steel. The steel attains this heat slowly and remains in the furnace only till it reaches the exact temperature. There is no opening and closing of doors to cause intermittent drafts and make the heat difficult to control. One small door is sufficient.

One crew of men is kept busy removing the heated plates as the revolving floor brings them into position, while another crew inserts other leaves. Its operation requires seven men and it treats about 50,000 lbs. of steel per day.

When the furnace is in operation, the springs to be treated are placed cold on the revolving floor. During the revolution, they gradually attain the maximum heat of the furnace.

They are taken out at the end of the revolution and hardened in oil baths, the oil being kept at an even temperature through the agency of an air and water circulating system which maintains a temperature of about 90-120 degrees Fahrenheit.

After leaving the baths, the springs, which have been treated in the rotary furnace, are passed onto the "draw Furnaces." Passing through these furnaces on an endless chain conveyor for 30 minutes at a maximum temperature of about 900 degrees Fahrenheit, the "temper" or hardness is modified to give the metal the necessary tensile strength and ductility required by the severe service given to a truck spring.



A Testing Trestle at Wichita Falls

This trestle has been in use five years by the Wichita Falls Motor Company, Wichita Falls, Tex. One of the grades is twenty-seven per cent and the other is eighteen per cent. This is located just outside the big Wichita plants and all Wichita trucks are tested on it, in addition to grueling runs over the ridged plains.

The CCJ has most readers because it gives most information

How to Become a Successful Commercial Car Dealer

By GEORGE W. GRUPP

HOW may I become a successful motor truck dealer?" This question confronts every dealer no matter how humble his position. But before he can answer this question he must first know the qualities which make up a successful dealer. And then with these facts in his possession he must set out to discover himself.

In the first place, success does not depend so much on where you are standing as to the direction you are moving. And to reach your port of success you must sail with the wind and against it and never drift or lie at anchor—sail.

Continued success of any dealer is due to individual qualities not possessed by others. But what are some of these individual qualities which make for success? Are they within the reach of all dealers? They are if the dealer will not wait for his ship to come sailing in, but will grab an oar and meet it. But after all personal or individual qualities count for nothing if the dealer fails to use them.

Capital

Now the FIRST quality which makes a motor truck dealer successful is capital. Without it he can do absolutely nothing. He must at least be able to buy a few trucks to be used for demonstrating and selling purposes. He ought to have capital to maintain a service and parts department or his customers will forsake him for a better equipped dealer.

Personality

SECOND, the dealer must possess personality. He must possess the power of personal attraction. He must be magnetic, always pleasing and courteous. Remember courtesy courts success.

Thorough Training

THIRD, he must have a thorough training, not only in salesmanship which is very essential, but he must also be thoroughly trained mechanically. In addition to this he ought to be well posted on all legal and other points of interest to motor truck users. He should train continuously to become more efficient and up to date, keeping abreast with the methods and ideas of the other dealers. This information may be obtained by being a constant reader of the motor truck trade journals, such as THE COMMERCIAL CAR JOURNAL. Every item should be read from cover to cover, including the advertisements, as they also make for efficient training.

Imagination

FOURTH, every dealer must possess the power of imagination. But why imagination? Doesn't the prospective buyer or old user prefer dealing with a practical, materialistic sort of dealer rather than with a dreamer? True he does, but the dealer's imaginative power often clinches the sale. He must use it to place himself in his prospective buyer's position. He must draw on it when trying to make a point clear which is muddy to the prospect Then again, he must use it when making plans for future conditions and trade.

Good Judgment

FIFTH, all successful dealers use good judgment. They never allow their excited heads to get the better of them. They dispel the negative qualities of sound judgment, such as contradiction, unasserty, conditional, universal, substitute, sameness, etc., and replace them with the positive qualities—apodictic, assertion, hypothetical, categorical, original, particular, and comparison.

Courage

SIXTH, he must be courageous. Not only morally and physically, but commercially. Without courage he is like a lantern unlit, a boat unanchored, a horse untied, and seeding grass for his own grave. This world admires the strong and courageous but not the coward. The business coward is pushed aside to make room for the great possession of the courageous. The successful dealer always possesses the courage of initiative and venturesomeness. He does not wait for a body guard to protect his ideas. He is of fearless courage. He goes out and starts and does things for himself. New ideas and methods he brings into execution.

Confidence

The SEVENTH quality is confidence. No man has ever been successful who did not have the completest of confidence in himself and his fellowman. Doubt in one's ability is sufficient to wreck any man's hope and ambition. Doubt locks the safe of opportunity but confidence ciphers the combination.

Social Connections

EIGHTH, social connections sometimes help a dealer very materially. These may be made through the family tree, clubs, fraternities and similar organizations. All these things boom the number of his acquaintances. And if he is square he at once becomes the respected citizen of his community. And as a result of this honorable reputation they come to him unsolicited to buy their motor trucks.

Business Associates

NINTH, business associates or partners are very important. Two men of an acid temperament never make up a successful firm. Much care and common sense therefore must be exercised in choosing a partner, as much is at stake. A firm is never successful where there is friction. Friction causes them to pull apart. What one builds up the other destroys. Therefore, they must be a good team and pull together.

Organizing Intelligence

TENTH, intelligence in organizing is another quality of importance. Should he fail to stand up in this particular his office and sales force is apt to go to pieces. His territory will become neglected and the other fellow will get his profits because he is a better organizer.

Knowledge of Men

ELEVENTH, no dealer develops into a "big man" without a knowledge of men. This is imperative in the making of a sale. Every dealer should know how to classify men as to their temperament, the best way of approaching and closing with each type of humanity. This must be studied carefully and thoroughly and not haphazardly. Much of the "getting on the customer's nerve" would be avoided and the sale would have been made more easily and quicker.

Perseverence

TWELFTH, he must be persistent in his efforts. Stick-to-it-ive-ness should be part of his creed. He ought to eat, think, talk, dream, sleep, court, live, and marry motor trucks. How do you suppose the bee became the best builder, the spider the best weaver, the nautilus the best sailor, the worm the best miner, the ant the best drayman, the guinea pig the best breeder, the parrot the best orator, the canary the best singer, the monkey the best actor, and the flea the best athlete if they had not made a constant persistent effort. And how do you suppose the successful dealer became a success without having made a constant persistent effort to be such? It would have been impossible—he must have persevered.

Conclusion

Therefore the dealer who wishes to become successful and reap the profits to which he is entitled must have capital, personality, a thorough training, imagination, sound judgment, courage, confidence, social connections, good business associates, organizing intelligence, a knowledge of men and be persistent. He must always speak the truth and be bubbling over with enthusiasm.

COMMERCIAL CAR HELPS NEWSPAPER IN GALVESTON STORM

The Galveston Tribune's press room was put out of business by the tropical gale. Their floors and machinery were flooded, and as the city's gas and electric plants were out of commission apparently there was no hope for an edition.

Ingenuity came to the rescue and the management secured a 3½-ton Wichita power dump motor truck, made by the Wichita Falls Motor Co., Wichita Falls, Tex., which was put in position, the rear wheels jacked and a pulley attached from the wheels to the press. This timely and unique method of power application resulted in the first edition of any paper since the city was devastated by the storm.

The Wichita motor truck used in the work was also caught in the flood and thoroughly soaked, and it is all the more remarkable it should have been in condition to render such signal service to the press.

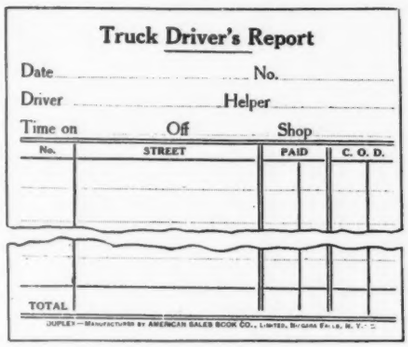
The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

The Equipment of the C. W. Miller Transfer Company, of Buffalo, and How They Use It

By GEO. W. GRUPP

IT was five years ago that the C. W. Miller Transfer Co., the largest and oldest transfer and baggage concern in Buffalo, and one of the largest in the United States, decided to replace 150 horses and 75 wagons with 31 Grabowsky and Horner ton, ton and one-half and two ton trucks. At the same time they decided to replace their scores of cabs with fifty taxis. To sell the old equipment, buy the new and remodel the large stables into a garage consumed a year's time.

The garage is a seven story brick 70x230 ft. building. It is the most complete and best equipped private garage in Buffalo. Every bit of the repair or remodeling work on trucks is done within its walls, as it is equipped with a truck storage department in the basement, taxi storage and offices on the first floor, a blacksmith shop and tire department, on the third floor, a machine shop and battery department on the fourth floor, a wood shop, trim, tailoring, paint and varnish department on the fifth floor, an engine repair, lamp and radiator department on the sixth floor and a large elevator which carries the trucks from floor to floor. The second and seventh floors are used for the storage of various materials and supplies. In these departments thirty-five men are constantly employed. The upkeep of this, including the cost of materials used in making repairs, amounts to $18,000 a year. (This amount includes the repairs made on taxi cabs but does not include truck drivers wages, gasoline or oil expenditures.)

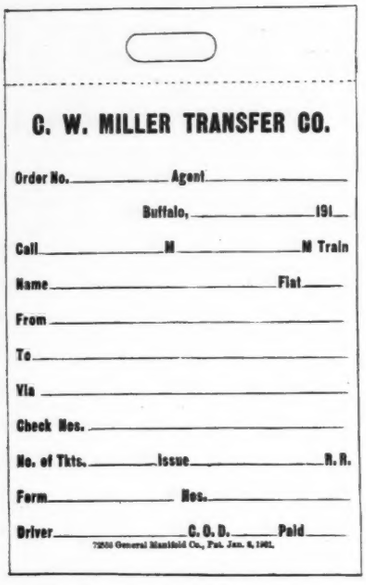

Truck Driver's Report

Date ..... No. .....

Driver ..... Helper .....

Time on ..... Off ..... Shop .....

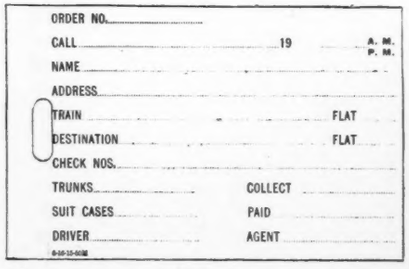
No.	STREET	PAID	C. O. D.



Tag Used by the C. W. Miller Transfer Company, Buffalo

For checking baggage from a traveler's house to his destination, his place of stopping if he so desires. On the back of this card the owner of the baggage is supposed to sign a declaration of value. This is only done if the traveler has a railroad ticket. Actual size 6 x 3¾ in. This is made out in triplicate by means of carbon paper.

as they were when we bought them." He continued by saying, "I have found other transfer concerns who have abandoned the same make of truck we use and say its "no good." Now the trouble isn't always the truck or the driver but the owner. He refuses to give immediate attention to



Call Order Tag

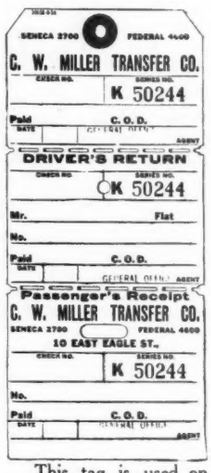
Used by the C. W. Miller Transfer Company, Buffalo. Actual size 5 x 3¼ in.

minor defects or adjustments which develop into big defects and big repair bills."

Some of the many difficulties which their trucks have overcome are: First, poor service; second, where in the past twenty-five wagons were out after 8 p.m. with no certainty as to their whereabouts, only four trucks are now needed; third, the baggage which in the past was always exposed to the rain and snow is now protected under a canvas which may be removed or put on in a few minutes. This canvas is tied to the rear of the driver's seat so that it is always ready for use; fourth, the difficulty of having to lift the baggage over the high sides of a wagon box has been removed, as the trucks have

Baggage Exchange Check

Used by the C. W. Miller Transfer Company. Size 5 x 2½ in.



This tag is used on baggage delivered from the railroad station to the house.

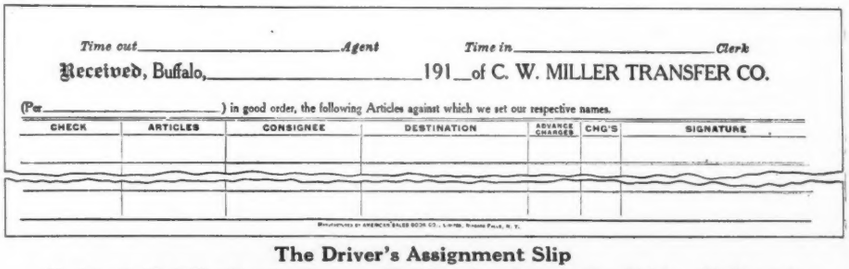
only flat bottoms with 2-in. strips around the edge.

As their territory covers an area of 44 sq. miles, each truck is assigned to a given district. Twelve cover the west side of the city while four the east side. Two are used exclusively for transfer service between the railroad stations. The two used for transfer service and two others used to collect baggage are the only trucks run all night. The others run from 6 a.m. to 7 p.m. On Sundays they work one-half their crew.

At the various railroad stations the baggage is sorted for assignment. As it is assigned it is noted on a slip which is given to the driver to whom the baggage has been assigned. This slip gives such information as the check number, article, consignee, destination, advance charges or charges. As the goods are delivered the receiver signs for same. This is then turned into the office, after which the driver makes out a report as to his actual deliveries, causes for non-delivery, etc.

They estimate their cost of operation as follows:

	Per Truck
Gasoline	$.012
Oil	.008
Wages	.083
Tires, repairs, etc.	.012
Total cost per mile	$.115



The Driver's Assignment Slip

Used by C. W. Miller Transfer Company, Buffalo. Actual size is 11 x 5½ in. Made out in duplicate by means of carbon paper

Mack Trucks Demonstrate at United States Army School

The Government is using two Mack trucks for demonstrating purposes at the United States Army School at Plattsburg, N. Y. The three and a half ton model, shown herewith, has a trailer consisting of standard United States field piece with limber. Two machine guns are carried in the truck with fifteen thousand rounds of ammunition for them, and eight hundred rounds for the limber and field piece. The armor plate on both these trucks is removable. The smaller truck is the International Motor Company one-ton model AB. It is equipped with a Colt rapid-fire gun. Both tops are tarpaulin and removable. Each truck is driven by a professional driver and also a first-class mechanic.

The CCJ leads in circulation, advertising and prestige

An Instance of How to Sell Motor Trucks

Taken From the Most Unfavorable Part of the Country for Motor Travel, the Rocky Mountains

By GEORGE F. WHITSETT, of the International Harvester Company of America

SEVERAL motor truck and automobile men have said to me within the past 6 months, "Well, the big automobile companies would have been on the rocks, so far as their motor truck business is concerned, if it hadn't been for the present war."

However true this may be, the fact remains that several of the companies are receiving big war orders—orders large enough to take up the slack and make the factory wheels speed up. It is also true—and this is more significant for the truck business—that one concern with an annual capacity of several thousand trucks has got along without war orders, because, the head of its motor truck selling organization believed that a large enough domestic trade could be developed to keep the factory going at capacity. There is nothing small about the factory either, for it is one of the largest in the world devoted exclusively to the manufacture of commercial cars.

This man's judgment has proved sound, for the factory has been kept at capacity production, and on July 1st the Company's motor truck business was in excess of the total sales for 1914. The company in question is the International Harvester Co. of America, which sells trucks of the light and medium class in three sizes—1000, 1500, and 2000 lbs. capacity. The last two sizes are 1915 additions to the lines and the sales of the two new models have been flattering. So far as the increase is concerned, however, the MW, the 1000-lb. truck, has been responsible for the great bulk of the business.

The success which the International Harvester Co. has had with business at home is one of the most encouraging developments in the motor truck business. International trucks are now in use in more than 200 distinct lines of business activities, and hardly a month passes without a new representative entering the fold of motor delivery.

The principal elements in the motor truck sales of the Harvester Co., which should be of encouragement and help to the motor truck industry in general, seem to be, first, that motor trucks can be sold in great quantities in the United States, and that no group of merchants or service stores are exempt from haulage and delivery problems, which make motor trucks a necessity, after the facts are known. The second element is that studying conditions is second only to having faith in the field, and that before delivery facts can be presented with strong enough emphasis, the prospect's needs must be studied carefully and at first hand.

To illustrate this point, I shall quote from the experience of a dealer who has had to face the most trying demands imaginable when he offered his motor trucks for sale. Incidentally, a set of conditions will be described which will make dealers in sections of the country, the streets and highways of which seem to be constructed with the motor truck in mind, feel ashamed of themselves for not getting more business.

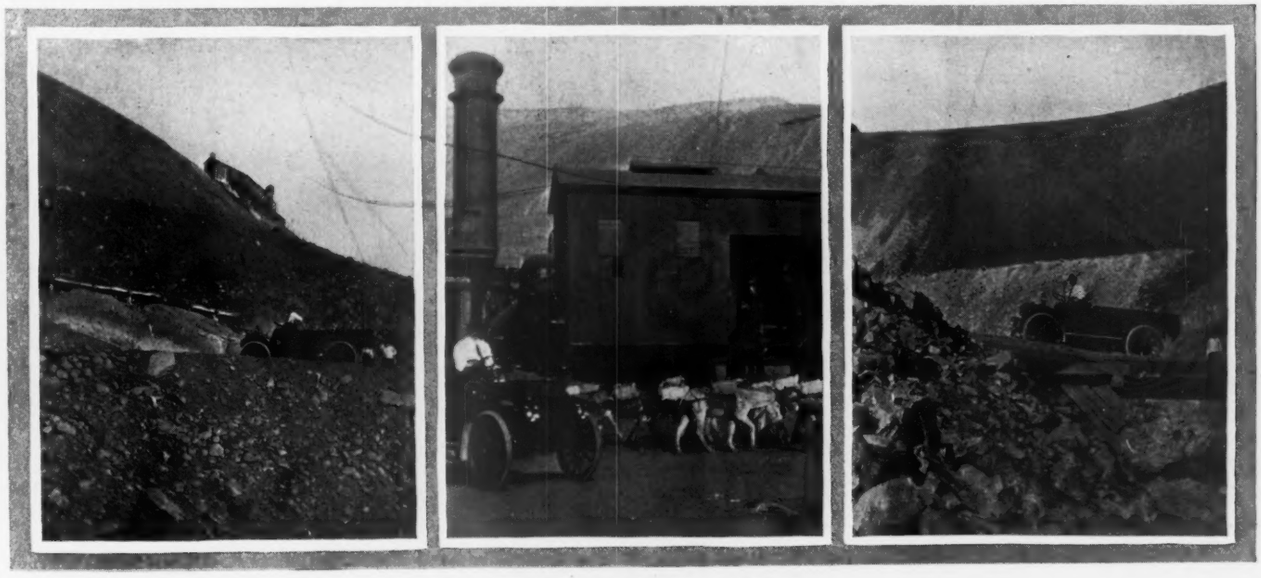
A motor truck dealer in California finds that many of his prospects are men who carry mail or haul passengers over long and arduous trails in the Rocky Mountains. In order to know the problems of such prospects, this dealer went out on the trails with his customers and studied the rigors of mountain mail and passenger service which had to be endured by motor trucks and which the use of motor trucks would alleviate. He did not take one, but many such trips, until he had traveled over practically all of the State of California.

This dealer in a recent interview described one of these trips. Without making himself known to the driver, he rode over the mountains in one of the motor trucks which was traveling on the stage route between Crescent City, Cal., and Grant's Pass, Ore.—a distance of 99 miles.

"The trail," to quote the dealer, "leads over the Oregon Mountains. About 5 miles out of Grant's Pass we took the first grade, which was pretty stiff, and 1 mile long. I asked the driver if he had any more like it, and he informed me the next grade was 5 miles long and full of rocks. We had to make almost the entire distance on low gear, and you can imagine about how I felt when the driver told me the next grade was 9 miles long—and I want to assure you he did not exaggerate any. It was the most grueling, grinding test that any machine could be put to.

"The trail winds around and around the mountain, and some of the curves are so short that it is necessary to back up in order to make the turn. In some places there was not more than 12 to 18 in. to the edge of the bluff, and it was from 1000 to 1500 ft. straight down.

"About 15 miles east of Crescent City we entered a redwood forest. The shade



An International Truck in the Rockies

Some of the daily experiences of a truck in this mountainous part of the country

The CCJ has most advertisers because it gives them biggest returns

is so dense that the roads never dry, and for 10 miles it is an up-grade from 20 to 25 per cent., and on a corduroy road. In addition to the rough corduroy road, it was very slippery, and you will, no doubt, be surprised to know that the little 1000-lb. truck was carrying a load of full-rated capacity.

"At 5.00 p.m., Tuesday, we started on our return and by 3.00 p.m., Wednesday, we had completed our round trip over the 99-mile trail. The trail is undoubtedly the wildest part of California, and perhaps of the United States. We saw deer, both going and coming.

"This trip gave me new confidence in my motor truck, and at the same time gave me talking points with which I could face new prospects."

Even while he was crossing the trail, this California dealer was sowing the seeds for future sales, and shortly afterward he received orders for seven more trucks from the same locality. The comments enclosed with one of the orders throws some light on why those men feel inclined to add to their motor truck equipment.

"Both of the trucks we purchased from you," writes the customer, "have given us most excellent service on our stage route between here (Crescent City, Cal.) and Brookings, Ore. The weather was very wet last month and the roads muddy and rough, but we did not miss a trip. We carried a full capacity load every time, and were often tempted to do overloading.

"We are thinking of selling off some of our horses and replacing them with these trucks, as they are more economical and do the work so much quicker."

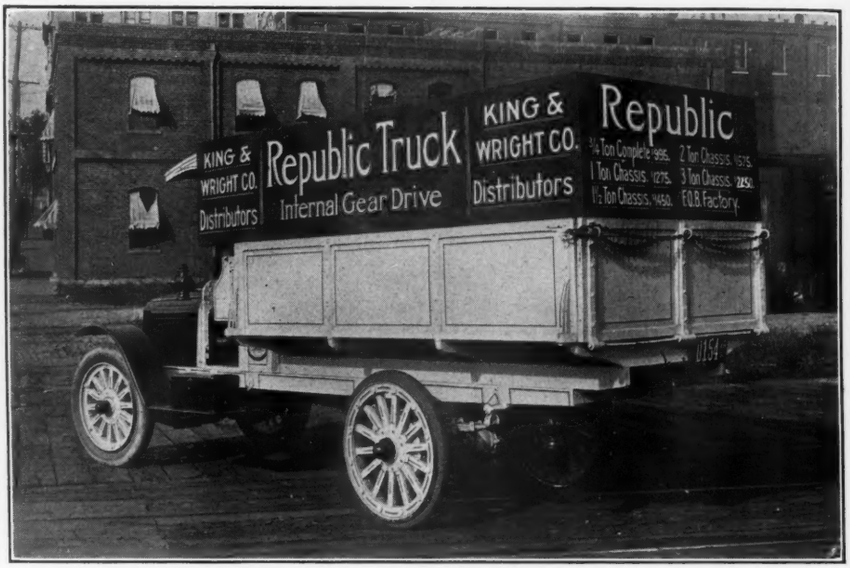
One of the dealer's salesmen, who works on the mountain business in the same locality, contributes to the discussion by describing the amount of work done in those rugged altitudes by the motor trucks.

"I sold five trucks last June to the mail contractor between Crescent City in California and Grant's Pass in Oregon, and he made three of those do the work of fifty-two horses during all of last summer and four of them are now doing the same work. The mail has never failed to give full and complete service and has come in regularly, from 6 to 8 hours earlier than the schedule time."

These facts preach a strange paradox in motor truck sales, in that the most unfavorable regions for motor truck travel may be made the most favorable for motor truck sales if handled in the right spirit by the dealer. This right spirit, according to the California example, is to push out into the territory, watch the trucks stand up under the apparently impossible, and then bring these facts to bear upon the men who still follow the dictates of a mistaken loyalty to horse flesh.

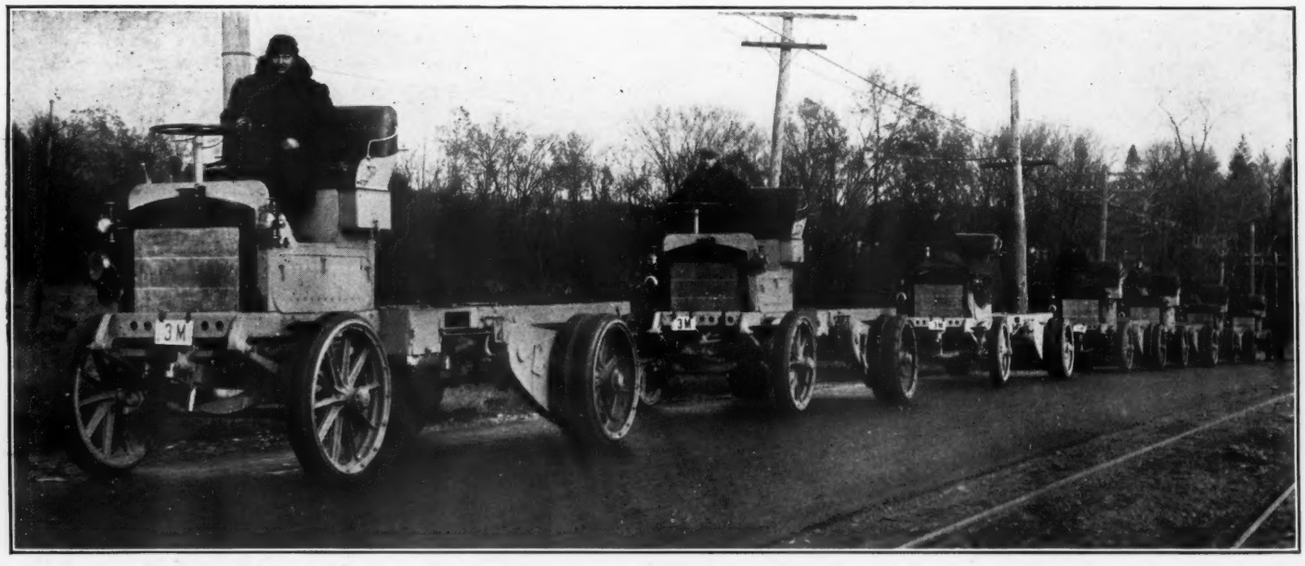
The truth probably is that every prairie, hamlet, and mountain is alive with motor truck prospects, who are only waiting for salesmen and advertisements to reach them with convincing proofs. It seems that America has some wonderfully good things to offer in the way of motor truck sales to the dealer who will take a truck of known quality and advertise and push it in his territory, believing that if a demand does not exist, it can be created.

Lack of faith in the local field has been responsible for the lack of sales in all territories. One man does not believe in his home country, and another does not believe in his home county. Where is the difference?


KING & WRIGHT CO. Distributors
Republic Truck
Internal Gear Drive
KING & WRIGHT CO. Distributors
Republic
¾ Ton Complete 995. 2 Ton Chassis 1575.
1 Ton Chassis 1275. 3 Ton Chassis 2250.
1½ Ton Chassis 1450. F.O.B. Factory.

A Republic Moving Bill-Post

This is a Republic three-quarter ton furniture job made by the Republic Motor Truck Company, Alma, Mich., on which the King & Wright Company, state distributors, Richmond, Va., has placed a large sign, enabling them to utilize the advertising value of the truck while being used for demonstrating purposes.



Locomobile Trucks Going to the Front

The Locomobile Company of America, in making shipments from Bridgeport, Conn., to New York City, has found it cheaper to run the cars over the road than to ship them by rail. Here is shown a line of the cars en route between the factory and the shipping point. The method has also been found to be more rapid.

The CCJ has most readers because it gives most information

Firestone Leads by Big Majority
MORE Firestone Truck Tires, by far, are in actual use today than any other one make.
The fact that truck owners of longest experience give this marked preference to Firestone is proof of "Most Miles per Dollar" and satisfaction. The Firestone combination of wearing quality with resiliency insures this service.
There is a Firestone truck tire for every road, load and condition, and a Firestone Service Station in every large trucking center with specialists at your command, to advise you. Call the station nearest you. Or write us for details and low prices.
Firestone Tire & Rubber Company
"America's Largest Exclusive Tire and Rim Makers"
Akron, Ohio—Branches and Dealers Everywhere
C. M. Seidel
Firestone
TRUCK TIRES

Single Truck Owner Capitalized Opportunity

Began With One 1-Ton Truck, October, 1914, Now Operates Three, and is Making $600 a Month Profit Above Salary He Pays Himself, Hauling Milk and Freight

By FRANK REED

"WHAT chance has the dealer to find men or firms who will, through the advantages of truck operation, raise themselves from the condition of being one-truck prospects to that of owning several? In other words, under what conditions does the sale of one truck actually finance the purchase of additional machines through expansion of what was strictly a one-truck business?"

This is a question of general interest to the trade and to the men who are hesitating about making their investment in the only truck they can afford. J. A. Stoner, of the Mack Motor Truck Co., in Los Angeles, answered it by saying, "See Amos R. Brooks. He has not only paid for his first truck, but by next spring will have earned an $11,000 investment in the three trucks and trailers and a roadster he is now operating. This is in a milk hauling business he started last October."

Here are the facts about Brooks:

A year ago he found himself owner of a 1-ton International truck, which he was operating in an independent local transfer business in Los Angeles. Like others in this line he felt a slump, and saw that he would have a hard time to make a good living. He had a doctor's bill of a good deal over $1000 to pay. He thought there might be good money in hauling milk, and made inquiries of city milk distributors, who gave him no definite encouragement. Then he took a week off and drove his truck through the dairy towns. When he found Norwalk he learned that there was volume enough to give him employment, but five individual truck owners had tried it in succession and quit, failures. The dairymen felt that he would not make good, but after strenuous solicitation he got promises of twenty-eight cans a day. He hauled his first load, twenty-eight cans, in the 1-ton truck, October 13, 1914. In August, 1915, he was hauling capacity loads with three trucks and two trailers, and making $600 a month profit over all running expenses, including a salary to himself of $75 a month.

The growth of his business in truck requirements was as follows:

November 15, 1914, he was hauling fifty-five to sixty-two cans, and put on a Mack 1-ton truck to replace the old one, and employed his brother and a 1½-ton machine, which failed to make good. In December he hired a truck for the month to replace it. On January 1, 1915, he bought his second Mack, a 1½-ton, to replace the hired machine. His third Mack, 1½-ton, was bought May 12, 1915.

In January he was hauling two truck loads and one hundred cans over, and took on a 3-ton trailer with roller bearings and steel axle. Vibration showed up the defectiveness of this trailer in 30 days, and he had a wagon maker build a trailer from his own specifications, which worked fairly well, although he has learned where improvements could be made. On May 20 he bought a trailer from the L. A. Trailer Co. Both trailers are 2-ton, forty can capacity. He pulls one behind each of the 1½-ton trucks, which carry in their own bodies sixty-two and sixty-four 100-lb. cans respectively.

Mr. Brooks thought when he went on the route that if he got a load for one truck he would be doing well. He believes his success was due to his leaving at the same time every morning, was on the job himself and made good, and the men he started to work for told their neighbors.

Three Mack Trucks and Two Trailers at Plant of Los Angeles Creamery Company
Their owner, Amos R. Brooks, who stands in foreground, is making them produce a profit of $600 a month, hauling milk, freight, produce, and general moving

Reduction of Pick-Up Time and Creation of Back-Haul Load

It takes his men about one and a half hours to pick up a load for a truck and trailer. Dairymen haul their milk to stands at the roadside, from which the trucks pick them up. Only in the case of a few producers who have ten to twenty-five cans a day and are easy of access does a truck drive into their premises. There was no opposition to the idea of putting up stands at the start, and the few who were inclined to be late speeded up their delivery when they found that the truck was always on time and went away without their cans if they were late.

The business secured by Brooks had previously been carried by the steam and electric railways. The farmers had been hauling their milk an average of two miles to the stations, and his pick-up service saves the community about eighty-five hours a day of this short-haul time. His rate is the same as the railroad rate. The haul is 17 miles, over macadam road, and delivery is facilitated by an automatic chain elevator for the full cans, and spiral roller chute for the empties, at the creamery in Los Angeles. It takes about seven minutes to unload a truck and about ten to stack the empties, working the driver and a helper provided by the creamery to unload.

The territory served has been producing all the milk it could for some fifteen years, so the business secured by the trucks has not been due to expanded production, but to diversion from the railroads. The steam and electric railroads after making a determined effort to retain the buiness have cut out stops and taken off station help, as the trucks have not only taken the creamery business, but now pick up freight from city manufacturers and jobbers and haul it to local merchants. This business was worked up from the local end and gives a good revenue producing back-haul. The balance of the day the trucks usually have plenty to do hauling local produce, potatoes, corn and fruit, and doing general moving. This kind of work is handled promptly, even if it is necessary to work nights, and this reliable service brings the business.

The economic gain from the substitution of trucks is shared by the creamery, which gets rid of the haul it previously had to make itself from the railroad to its plant, which is located a considerable distance from track.

In the production of profits Mr. Brooks gives high credit to the economy of operation of his trucks. His first Mack has been in service since November 15, 1914, carrying daily overload, without costing a cent for repairs up to August this year.

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

WHITE TRUCKS

Awarded the GRAND PRIZE

BY THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION AT SAN FRANCISCO

THE ONLY GRAND PRIZE—THE HIGHEST AWARD FOR MOTOR TRUCKS

Was conferred upon White Trucks by the Superior Jury of Award, as officially announced by the Secretary of the Jury under date of August Second.

This is the ONLY GRAND PRIZE received by any motor truck at the Panama-Pacific International Exposition.

This decision of the Superior Jury of Award reflects the opinion of the largest users of motor trucks throughout the world—and is in accordance with the actual service results of motor truck experience. The points of merit upon which the Grand Prize is awarded are identical with those that have determined the selection of White Trucks by America's foremost firms in every line of business.

White supremacy in the motor truck industry is thus recognized by the highest award that can be bestowed by the greatest exposition the world has ever known—just as this supremacy has been recognized by motor truck users for many years.

REGARDING OTHER CLAIMS

The decision of the Superior Jury is final in the matter of Exposition awards. Hence any announcements of other motor truck manufacturers, claiming to have received the Grand Prize and Highest Award for motor trucks at the Panama-Pacific International Exposition, are automatically denied by this decision of the Superior Jury of Award.

THE WHITE COMPANY
CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in America

TIRE MILEAGE GUARANTEES IN GREAT BRITAIN

By OUR FOREIGN CORRESPONDENT

After the war broke out the manufacturers of solid British tires found themselves relieved of continental competition, and there was some talk about refusing future mileage guarantees on all tires. Thanks to the American tire manufacturers, however, this policy had to be abandoned, and the British makers have had to continue to adopt the mileage guarantee with some slight revisions, however, and with more conditions attached. Consequently the committee of solid tire manufacturers have drafted out a standard form of guarantee, which they recommend, but this is they say a point that should not be raised as a measure of the mileage to be obtained as a safeguard to the user against the supply of inferior or defective tires. This form of guarantee they advocate as a standard form to be used by tire manufacturers. Appended herewith is the form of mileage guarantee.

Standard Form of Mileage Guarantee

Where any mileage guarantee is given with solid rubber tires, the following form has been adopted by the leading solid tire manufacturers, who now issue no other form of guarantee, and give no extension either of period or mileage.

Guarantee

Solid rubber tires supplied for use in the United Kingdom are guaranteed for 10,000 miles' service.

We undertake that on a claim being admitted by us, the tire will be repaired free, or replaced at a charge proportionate to the failed mileage or unexpired time at our option, and in cases where tires are so replaced, the failed tires become our property.

The guarantee is given subject to the following conditions:

1. Claims under the guarantee must be made within twelve months from the date of the sale of the tire by us.

2. The vehicle to which the tire is fitted shall be maintained in good running order, shall not be run at excessive speeds, the brakes shall not be so applied as to cause the tires to "skid," and no error in wheel alignment shall be permitted.

3. The total load shall not at any time exceed that set out in the schedule below for the respective sections of tires.

Schedule of Loads

Section of tire	Maximum load per tire
75 mm.	10 cwts.
85 mm.	13 cwts.
90 mm.	15 cwts.
100 mm.	19 cwts.
110 mm.	23 cwts.
120 mm.	27 cwts.
130 mm.	31 cwts.
140 mm.	33 cwts.
160 mm.	40 cwts.

4. No liability will be accepted by us for accidents to vehicles, property, or individuals, arising in respect of vehicles fitted with tires the subject of this guarantee, and this guarantee is given instead of and expressly excluding any kind of implied condition or warranty, and the damages for which we make ourselves responsible hereunder are limited to the replacement of failed tires as above mentioned.

4a. The above guarantee shall not apply to the tires on any vehicle to which a trailer is attached, and the attaching of a trailer will be held to cancel any guarantee which may have been given. A limited and reduced guarantee (not exceeding 7000 miles) may under suitable conditions be specially arranged.

5. And such other conditions as may be set out in the "terms of sale" of the respective makers.

Beardsley Motor Truck Co., Los Angeles, Cal., has been taken over by the Moreland Motor Truck Co., of the same city. The Moreland Co. will supply parts and service to Beardsley owners.

NORMA BEARINGS NOW MADE IN AMERICA

Among the bearing importers affected by the outbreak of the European war was the Norma Co. of America, 1790 Broadway, New York City, organized in 1911 to handle in America, the product of the Norma Compagnie of Cannstatt, Germany.

This Norma line includes ball and roller bearings of all types. In 1912 a small shop was established for preliminary and experimental work, with a view to determining whether American methods and materials could together produce bearings equal to the imported article.

The results proved gratifying, and as a result the company was gradually extended and the facilities enlarged to meet demands in case bearings were not immediately available. The demand for these bearings immediately after the outbreak of the war was satisfied by the stock on hand, and shipments under way. In the meantime the company made additions to the American factory, and soon had a well equipped bearing factory making thousands of bearings a day.

For the first time in the history of the New York Post Office, the delivery of parcel post packages from the various stations and substations is being made by expert expressmen. The contract has been awarded to Monahan Express Co., and according to the postal authorities, there has been a notable improvement in the method of handling the packages. The company has put a fleet of thirty high-powered Denby trucks on the work.

The Twin City Four-Wheel Drive Co., with temporary headquarters at 2324 University Avenue, St. Paul, Minn, and capitalized at $500,000, has bought the J. L. Ware patents and trucks. The following officers have been elected: J. L. Ware, president; L. J. McDermott, vice-president; F. J. Drew, treasurer; M. T. Roche, secretary and general manager.

Kelly-Springfield Tire Co., 208 N. Broad St., Philadelphia, Pa., moved to new 3-story building at 257-59 N. Broad St.

FEDERAL TRUCK COMPANY HOLDS UNIQUE OWNERS' CONTEST

The Federal Motor Truck Co., Detroit, staged a contest among owners of trucks for the best reasons "Why I Bought a Federal." Some very valuable letters were received, and the points brought out by the various owners, gave the sales department material of the very finest class to work with. Every owner of a truck has some good reason for having bought same, and the salesman who knows most of the reasons why trucks are purchased can work more intelligently upon prospects than the salesman who has not this information. The company offered $300 in prizes to be divided as follows: 1st prize, $100; 2d, $50; 3d, $25; 4th, $15; and the next 11, $10 each. Every letter to be eligible in the contest had to give the number of Federal trucks owned by that concern, this feature proving quite valuable as a means of checking up the owners' records, which is usually a very hard thing to do from time to time.

Firestone Tire & Rubber Co., Akron, Ohio, at its annual meeting on September 1st, reported that the sales during the fiscal year were $25,187,884.33, an increase of $5,937,774.41 or 31 per cent. over the preceding year. The company is now producing 7500 pneumatic tires daily, and after the factory additions are completed, 12,000 will be the daily output. This increase of 4500 tires per day is larger than the original new Firestone plant which was erected on the present site four years ago. The company also manufactures 1100 solid tires daily, and arrangements have been made to largely increase this production. No orders have been taken from the warring countries.

A new motor 'bus line has been established by A. S. Reich between Harvey and Dolton and between Dolton and Hammond, Ill. A 32-passenger motor 'bus is being used for this service. Later Mr. Reich plans to operate a line to Blue Island. Several stretches of bad road between Riverdale and Hammond will be repaired.

Truck Donated to Orphan Home

The truck in the illustration was donated to the Juliette-Fowler Orphan Home, located one mile from Grand Prairie, near Dallas, Texas, by J. G. Culbertson, general manager of the Wichita Falls Motor Company. The work formerly done with wagons, this truck now does, and as well, takes the children to Sunday school, saving much carfare.

The CCJ has most advertisers because it gives them biggest returns

TORBENSEN

INTERNAL GEAR DRIVE

AXLES

Greatest Efficiency—Lowest Operating Cost

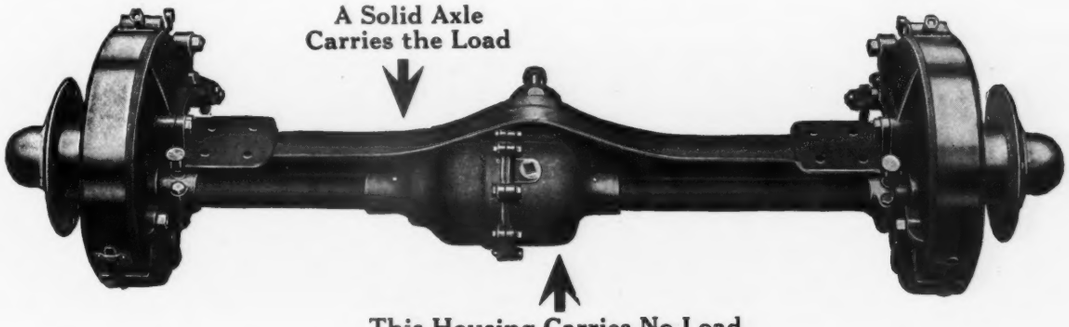
These two vital qualities are combined in a properly constructed internal gear drive, such as the Torbensen, which is recognized throughout the country as being the foremost exponent of this form of drive.

The combination of a solid I-beam axle for carrying the load, with a live axle, relieved of all strain, for transmitting the power, results in greater strength with less weight than in other types of drive.

This, together with the main speed reduction being made in the wheels, produces the greatest possible efficiency.

The lightness of weight, the absence of complicated parts, the freedom from repairs, and the durability of the parts, permit of exceptionally low operating cost. Instances are known of internal gears going much over 100,000 miles without repairs or showing appreciable wear.

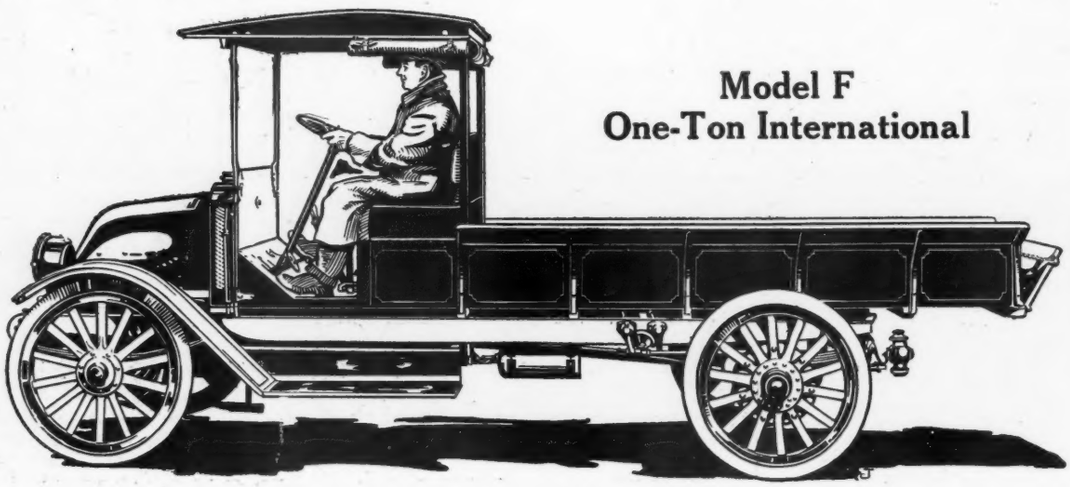
Our manufacturer's proposition will interest progressive makers —write for it.



Torbensen Gear and Axle Company

E. 72nd St. and L. S. & M. S. R. R., CLEVELAND, OHIO

(Formerly Newark, N. J.)



Model F
One-Ton International

The International Motor Truck Increases Profit From a Variety of Angles

Note the important point that the **International Motor Truck** is of great advertising value to your business. The International meets both the requirements of a good advertising medium. It gives you large circulation and the best of quality—both factors which the advertiser usually pays big money for, but which you get "thrown in" with the truck.

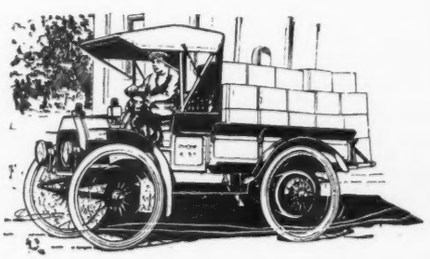
In an average day's work it covers about thirty miles. It passes from 3,000 to 10,000 homes and anywhere from 500 to 25,000 people on the street. That's some circulation.

It attracts attention because it puts the stamp of success upon your business. It marks you as a progressive, responsible business man and therefore as a good man to do business with. That is quality.

And it does this while it is earning money for you, and building up among your customers the feeling that they can depend on your service.

Figure up the advertising and business-building value of an **International Motor Truck** and you will probably discover that you are getting the truck for nothing.

Three models: 1000 lb., 1500 lb., and 2000 lb. capacities. Bodies to suit any business, or equipped to cash in on the advertising value of the truck.



Write for full information

International Harvester Company of America
(Incorporated)
182 Harvester Building **Chicago USA**

Supreme—in city traffic or open country

In the busiest streets of the world's largest cities—on open country roads—wherever trucks are used—there you will find GMC trucks in successful operation.

Market gardeners, merchants, manufacturers, jobbers, farmers, contractors, municipalities—men in 135 different lines of business—all are learning the advantage of using high quality GMC trucks—trucks that are built right by men who are exclusive truck makers.

GMC trucks are made in capacities from 1,000 pounds to six tons—made in worm and chain drive—made for gasoline or electric power—***made to fit your business.***

We are the only manufacturers in the world making a complete line of both gasoline and electric trucks. That is why we can advise you, without prejudice, as to the best size and type of truck for your work.

And your request for this advice will place you under no obligation—simply tell us what you have to haul, how much and how far, and the nature of your roads. If your proposition does not justify the use of motor trucks we will tell you so.

If you can use trucks economically, we will suggest the proper capacity and advise whether you should use worm or chain drive, gasoline or electric power or both. It will be for you to decide what make of truck to buy. But we believe your investigation will lead you to choose GMC trucks and the GMC way of doing business.

GENERAL MOTORS TRUCK COMPANY

One of the Units of General Motors Company

PONTIAC MICHIGAN

Direct Factory Branches:

New York Boston Chicago Philadelphia St. Louis Kansas City (22)

J-M AUTOMOBILE ACCESSORIES

One Firm One Service One Guarantee

A threefold assurance of satisfaction that covers the most complete line of automobile accessories marketed by a single company.

Quality — Value Responsibility

Three advantages which every car owner enjoys to the utmost who specifies J-M Accessories when in need of equipment for his car.

JOHNS-MANVILLE SERVICE

COVERS THE CONTINENT

LONG HORN

INVENTED BY G.F. LONG

Model "J"

A Little More in Price but—

When you buy a horn you don't want to have to buy another soon after. Do you?

When you pay out your good money you want it back in some form or other. Don't you?

Then why not pay a little more and get a Model "J" Long Horn? It'll cost you five dollars, but it's guaranteed for all time.

If any part ever proves defective we'll give you a new horn—that's our guarantee.

Model "J" is hand-operated. It requires no current to operate. The first cost is the only cost. And it's not a "makeshift," it's a REAL horn.

See the Long Horn dealer today. Booklet on request. 3115

Carter Carburetor

Makes motors more efficient. Saves fuel, gives greater power and insures perfect flexibility.

J-M Non-Burn Brake Lining

A true safeguard and a real economy. Grips positively and lasts longer. Unaffected by oil, water and gasoline. Absolutely proof against burning.

Jones Hub Odometer

The simplest and most accurate mileage recorder made. An indispensable device for figuring tire and fuel costs accurately. Price, $20.00.

A Plug That Won't Short-Circuit

A specially constructed plug with two deep chambers around the center electrode which make it literally self-scouring and most effectively guard against short-circuit due to carbon deposits.

J-M Mezger Soot-Proof SPARK PLUG

Made in two units which permit the porcelain to be easily removed and replaced without disturbing the shell in the cylinder, and which remain gas-tight under highest compression.

This plug is built to stand up and deliver. For fourteen years it has held the preference of the hard-to-suit owner. A real economy, because it seldom needs replacement. Price, 75c at your dealers. Ask for it by name. 3000

H·W·JOHNS-MANVILLE CO·

Akron, Albany, Atlanta, Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Denver, Detroit, Duluth, Galveston, Houston, Indianapolis, Kansas City, Los Angeles, Louisville, Memphis, Milwaukee, Minneapolis, Newark, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Rochester, St. Louis, St. Paul, Salt Lake City, San Francisco, Seattle, Syracuse, Toledo, Washington, Wilkes-Barre, Youngstown

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED Toronto Montreal Winnipeg Vancouver

15, 1915

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DIAMOND T MOTOR CAR CO. DIAMOND CHICAGO, ILL. U.S.A.

The

Most Complete Line of

Worm-Driven Motor Trucks

on the Market

FOUR MODELS

With the World's Best Units

¾ - 1 Ton - - - 1½ Ton - - - 2 Ton - - - 3 Ton

Read these brief specifications—they are standard units and are incorporated in all Diamond T Models

Continental Motors
Rayfield Carburetors
Brown-Lipe Transmission
Timken Front Axle
Gemmer Steering Gears

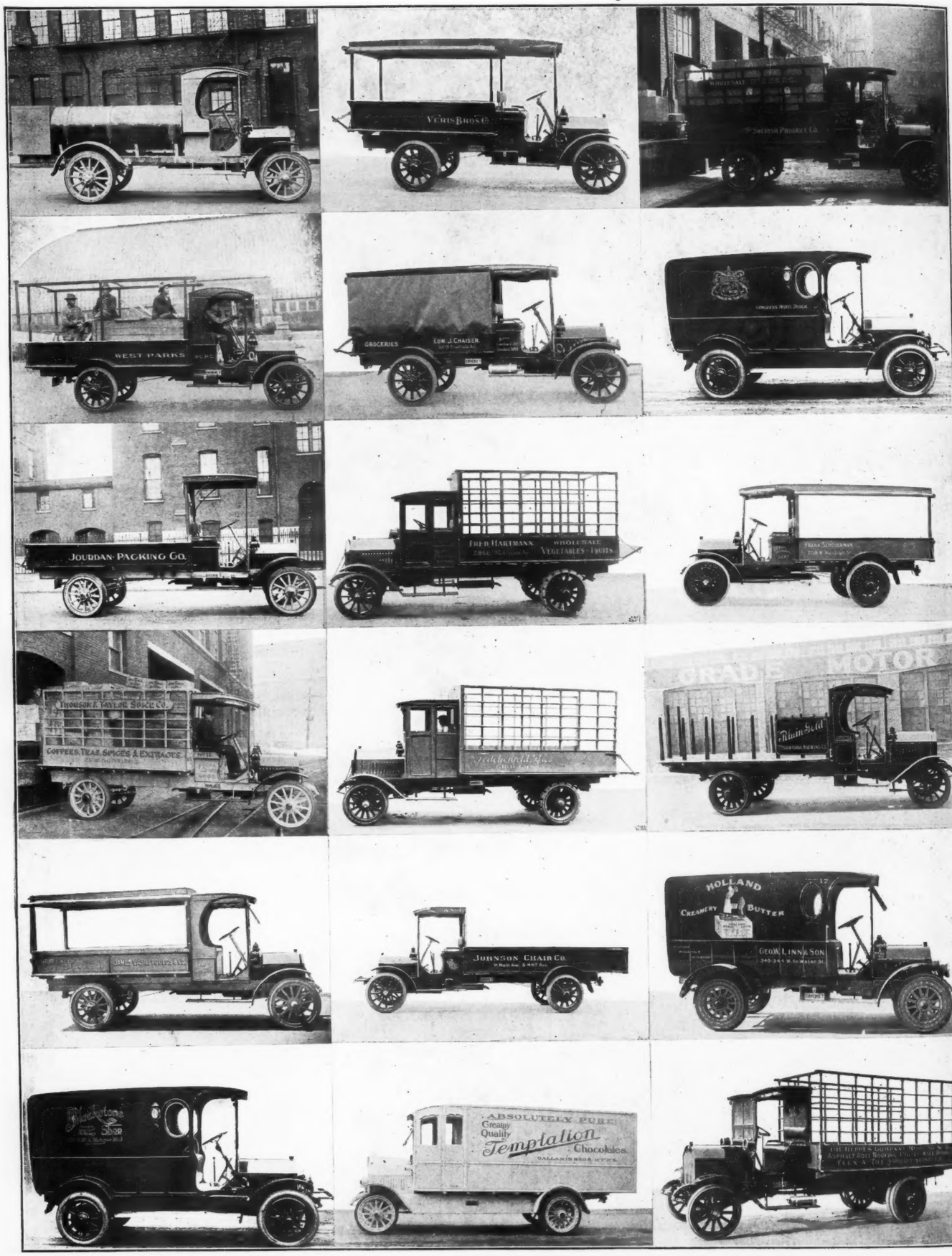
A. O. Smith Frames
Bosch Ignition
Spicer Universal Joints
Brown-Lipe Clutch

Timken Detroit Rear Axle
Timken David Brown Worm Gear
Mather Springs
Schwarz Wheels

Model J-3, 2-Ton Capacity

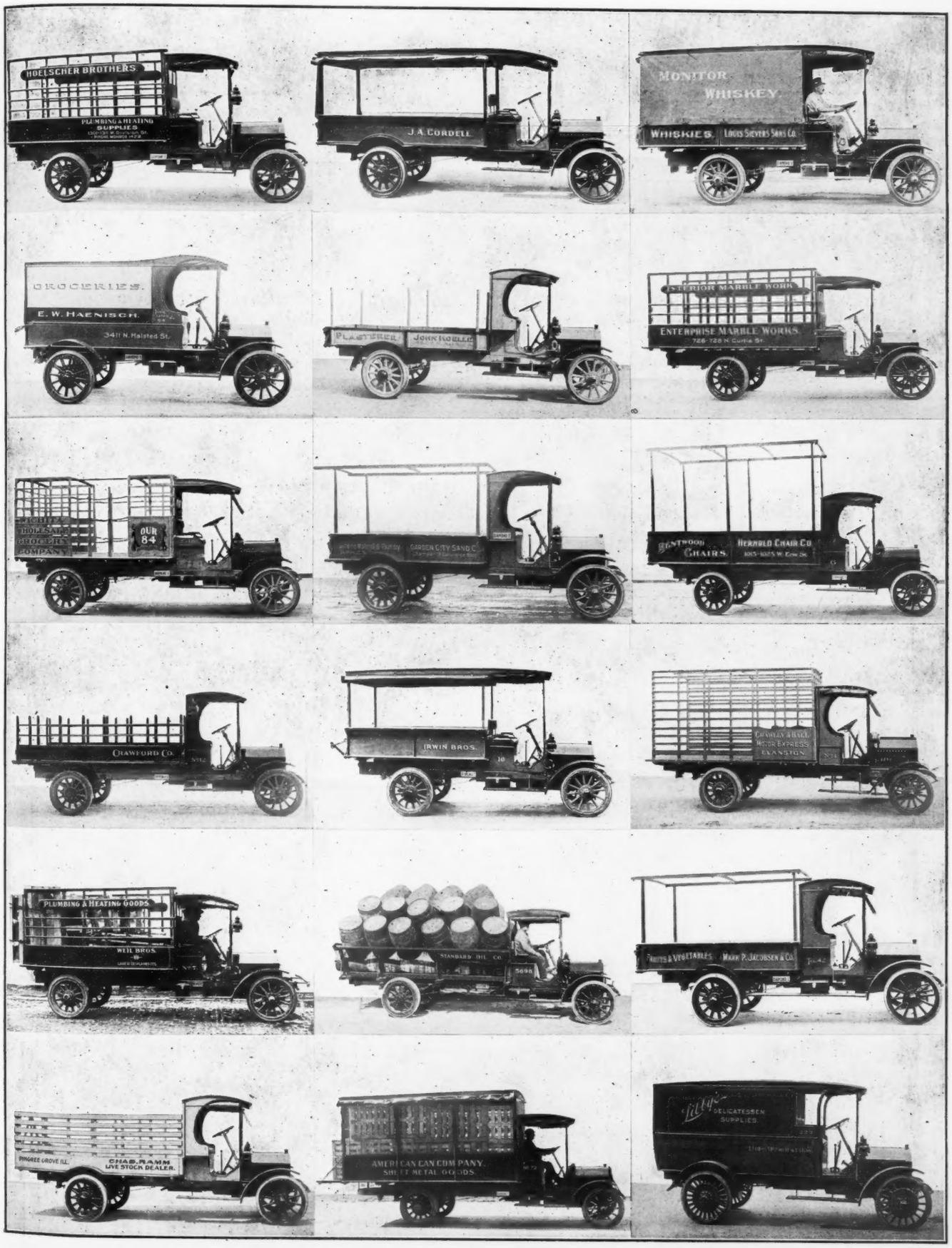
Diamond T Motor Car Co., Chicago, Ill.

Diamond T Models in all Sizes and in Varied Service



Diamond T Motor Car Co., Chicago, Illinois, U. S. A.

Illustrating the many types of Bodies supplied with Diamond T Chassis



Diamond T Motor Car Co., Chicago, Illinois, U. S. A.

To Live Dealers:

Starting *right now* and continuing indefinitely, manufacturers of a dependable line of motor trucks are absolutely assured a gigantic volume of business.

For 10 years we have been building and selling the DIAMOND T Trucks and Cars. These are all in constant service with many of the largest industrial concerns in the country.

The DIAMOND T business has been built up with the express purpose in view, of being in position to take advantage of the opportunity which now presents itself, and we are prepared to secure our share of the orders.

We plan to triple our output the next 12 months—we are out for every order that it is possible to secure—we have the product, the reputation and the financial strength to realize our ambition.

To get what is coming to us we must enlarge our organization—we must appoint dealers in unoccupied territory.

But the dealers we select must be awake to the possibilities of our proposition—we want men who realize that it is no longer necessary to point out the advantage of trucks over horses (merchants have been well educated along these lines), the problem that now confronts them is which truck to buy.

We will conclusively prove to our new dealers that the DIAMOND T truck is the answer to the merchant's delivery and cartage problem—we will supply our dealers with proven facts regarding the DIAMOND T trucks that will make them enthusiastic, and the enthusiastic dealer can make a clean-up in any territory with the DIAMOND T line.

If there ever was an opportunity for any man to get in the truck business right—it is here now, and the DIAMOND T line is your real opportunity.

Don't let your territory get away from you—don't delay—when your territory is gone, it's sewed up tight and you have lost it. DIAMOND T dealers hold on—they never let go.

Better wire or write us NOW

Diamond T Motor Car Co., CHICAGO, ILL. U. S. A.

A Flood of Inquiries

from dealers has followed the announcement of

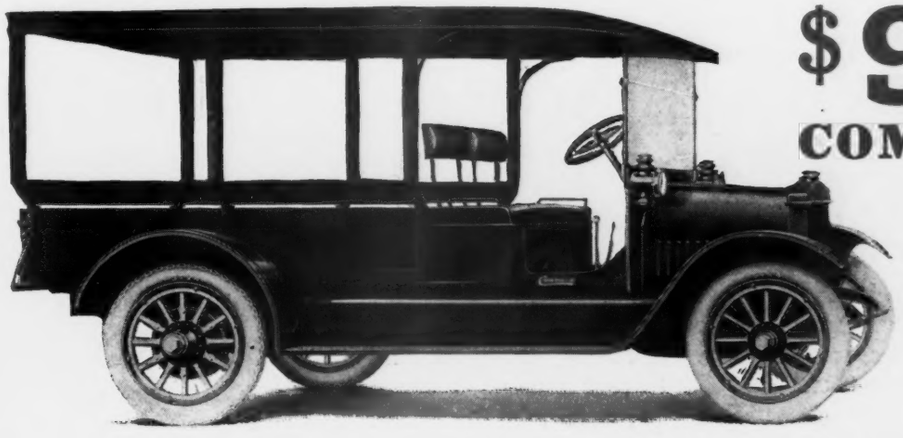
the 1916 Commerce

1500 Pound Truck

Dealers all over the country made immediate response to the announcement of the new Commerce truck. They recognized in it a truck that meets the requirements and demands of the day as no other one does. Hence the field is very large and the opportunities for big profits great.

We have closed with many of these dealers but good territory is still open. It is not our intention to be overhasty, but to secure the best possible representation. Consequently you still have a chance to get in on one of the biggest selling propositions of the day.

For the benefit of those who did not read the announcement we will repeat a few essential facts: **a 1500 pound truck built up to Commerce standard, having Continental 3½ x 5 motor, Eisemann waterproof magneto, 120 inch wheelbase, 3 speed unit transmission, ¾ floating Brown-Lipe gears, special shaft-driven rear axle, roller bearings, 16″ brakes,** drop-forged I-beam front axle, **vanadium steel springs,** 18″ steering wheel, 14″ cone clutch, demountable rims, etc. **Choice of three body types—all for $975.** This is enough to show we have a wonderful proposition. Write for complete specifications.



$975
COMPLETE
F. O. B.
DETROIT

Some one is probably applying for <u>your</u> territory—better write at once

Commerce Motor Car Company

Detroit, Mich., U.S.A.

KisselKar Trucks are enduring and economical

For substantial success there are always substantial reasons.

The great success of KisselKar Trucks is primarily due to experienced manufacture and high standards of construction.

Experience of years in truck production has brought to the Kissel Motor Car Co. not only the knowledge of how trucks should be built, but the determination to build them that way—and no other.

And hence KisselKar Trucks give their owners exceptional service, both from the standpoints of endurance and economy.

SEVEN SIZES OF KISSELKAR TRUCKS FOR YOUR SELECTION

The new models of KisselKar Trucks range in capacity from 1000 lbs. to 6 tons. The chasses prices are as follows:

1000 lb. delivery . . .	**$ 950**	**2½ to 3 ton truck . . .**	**$2750**
¾ to 1 ton truck . . .	**$1500**	**3½ to 4 ton truck . . .**	**$3350**
1 to 1½ ton truck . . .	**$1750**	**6 ton truck . . . . . .**	**$4350**
1½ to 2 ton truck . . .	**$2100**		

Our new portfolio is ready with full specifications and details, besides hundreds of illustrations. It is sure to interest you—send for it today.

Kissel Motor Car Company, 194 Kissel Ave., Hartford, Wis.

New York, Boston Chicago, Philadelphia, St. Louis, Wilwaukee, Minneapolis, St. Paul, Dallas, San Francisco, Los Angeles, Oakland, Omaha, Cleveland, Detroit, Toledo, Columbus, Rochester, Buffalo, Baltimore, Pittsburgh, Duluth, Seattle, New Orleans, Nashville; Hartford, Conn.; New Haven, Troy, Norfolk, Providence, Marshaltown, Ia.; Madison, Montreal, Toronto, Calgary, Victoria, and three hundred other principal points in the United States and Canada.

LUMEN'S No. 15 BRONZE

for Worm Drives

is used by the leading American truck builders. Its specification insures absolute safety.

Five years of service under severest conditions have proven its supremacy.

Physical Characteristics

	Sand Cast	Chill Cast
Tensile strength - - - - - -	35,000	50,000
Elongation - - - - - - - -	8%	10%
Brinell Hardness - - - - - -	74	100

(These figures are averages based on standard test cars)

We believe thoroughly in

No. 15 Gear Bronze

for its designated purpose. Our opinion is firmly supported by our customers.

Lumen Bearing Company
Brass Founders
Buffalo

YEARS of experience in the manufacture of motor trucks—exhaustive tests—close observation of the most efficient methods of transportation in all kinds of businesses—and the convincing testimony of users—stand back of

Selden Trucks

as a guarantee of their ability to render satisfactory service under the most exacting conditions every working hour of every working day in the year.

WORM DRIVE	CHAIN DRIVE
2 ton $2250	1½ ton $2000

If Selden Trucks are not being sold in your city, write to us at once about handling the territory.

Selden Truck Sales Co.
Rochester, N. Y.

Continental World-Famous

Simplicity

CONTINENTAL MOTORS — Powerful as the Nation — AMERICA'S STANDARD

STRIPPED of all superfluities, with clean-cut lines denoting native speed and strength, the Continental motor makes an instant appeal by its superb simplicity.

Continental Motors

Long experience has eliminated from its design any suggestion of the uncouth, the crude, the needless. Its lines are the lines of beauty, as well as of power. Its proportions are those not only of harmony, but also of correct balance. Its structure reveals the simple dignity of strength.

Continental simplicity goes far to account for Continental satisfaction; it assures readiness of control and adjustment, freedom from trouble, ease of repairs. Even the uninitiated can read the promise of the trim lines and fine proportions of this motor; the expert appreciates its masterly design. To both its simplicity is the mark of its merit.

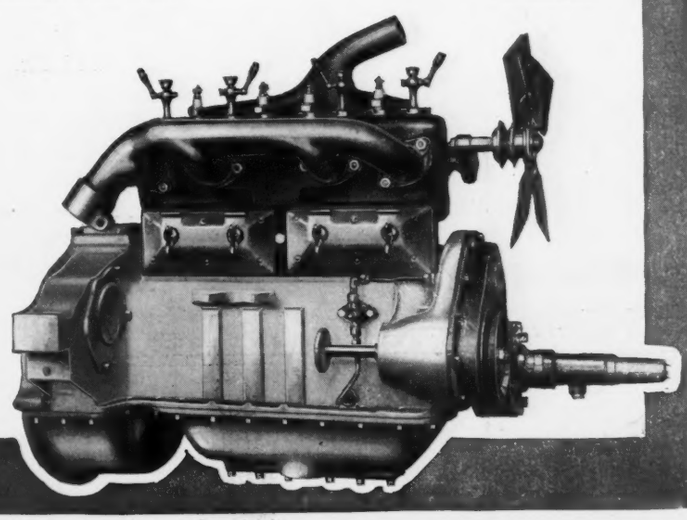
Let Continental Simplicity point ***your*** way to motor satisfaction in your next car or truck.

Continental Motor Mfg. Co.

DETROIT, MICH.

Largest exclusive motor builders in the world

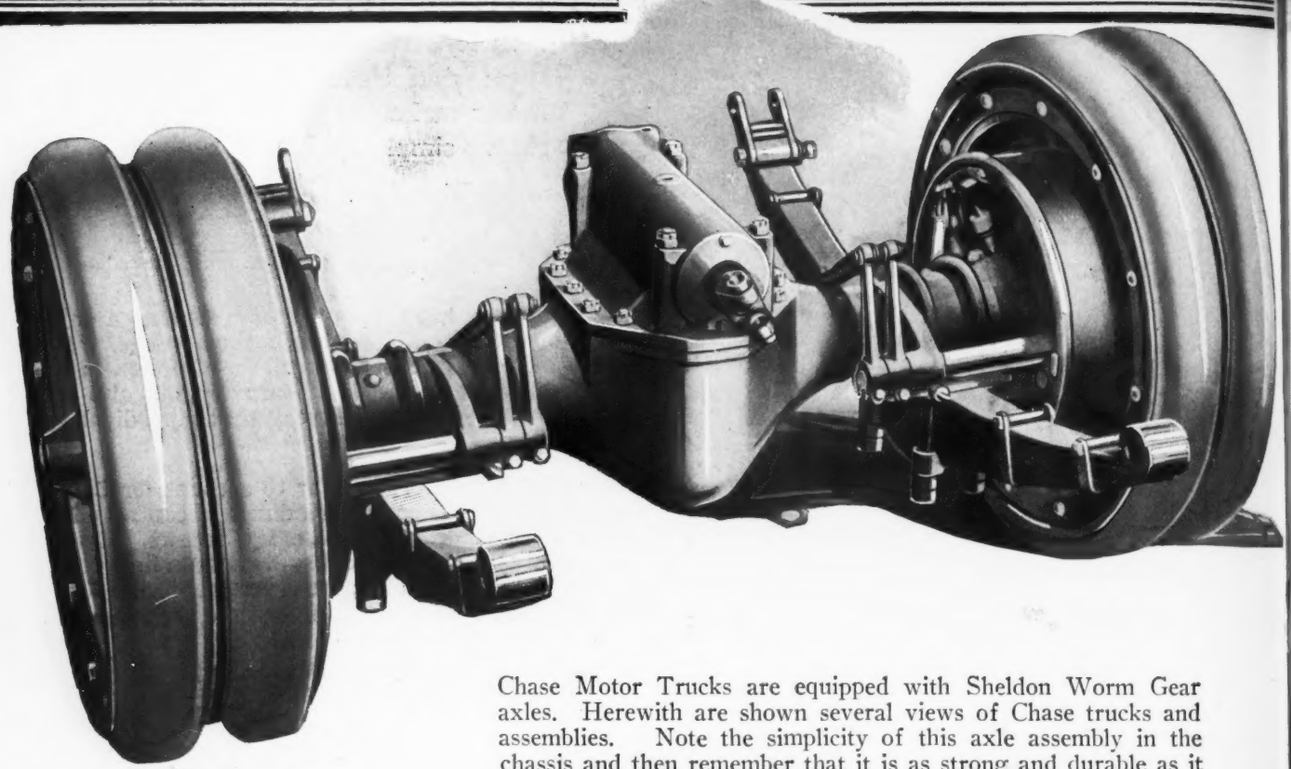
Factories: { Detroit / Muskegon

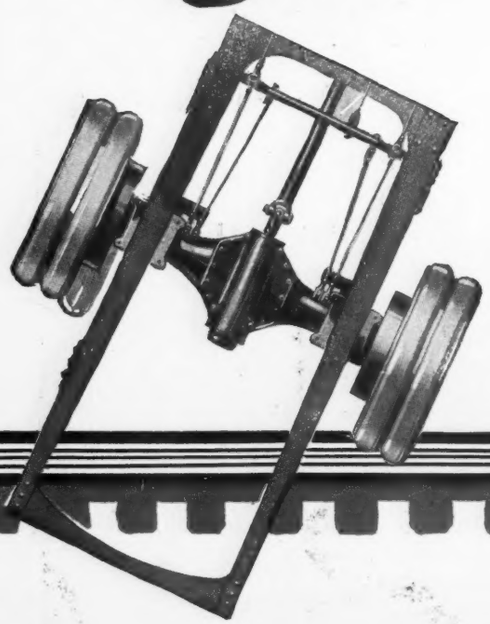


CHASE

SHEL

WORM GE





Chase Motor Trucks are equipped with Sheldon Worm Gear axles. Herewith are shown several views of Chase trucks and assemblies. Note the simplicity of this axle assembly in the chassis and then remember that it is as strong and durable as it is simple—and that Sheldon worm gear axles deliver up to 97 per cent of power applied.

This remarkable efficiency is due not alone to the general superiority of materials used and manufacturing methods employed, but basically to the design upon which these worm gear rear axles are built.

THE SHELDON AXLE AND S

Makers of Springs and Axles for Heavy Duty Service

WILKES-BARRE

Chicago: 122 S. Michigan Blvd.

Detroit: 1215 Woodward Ave.

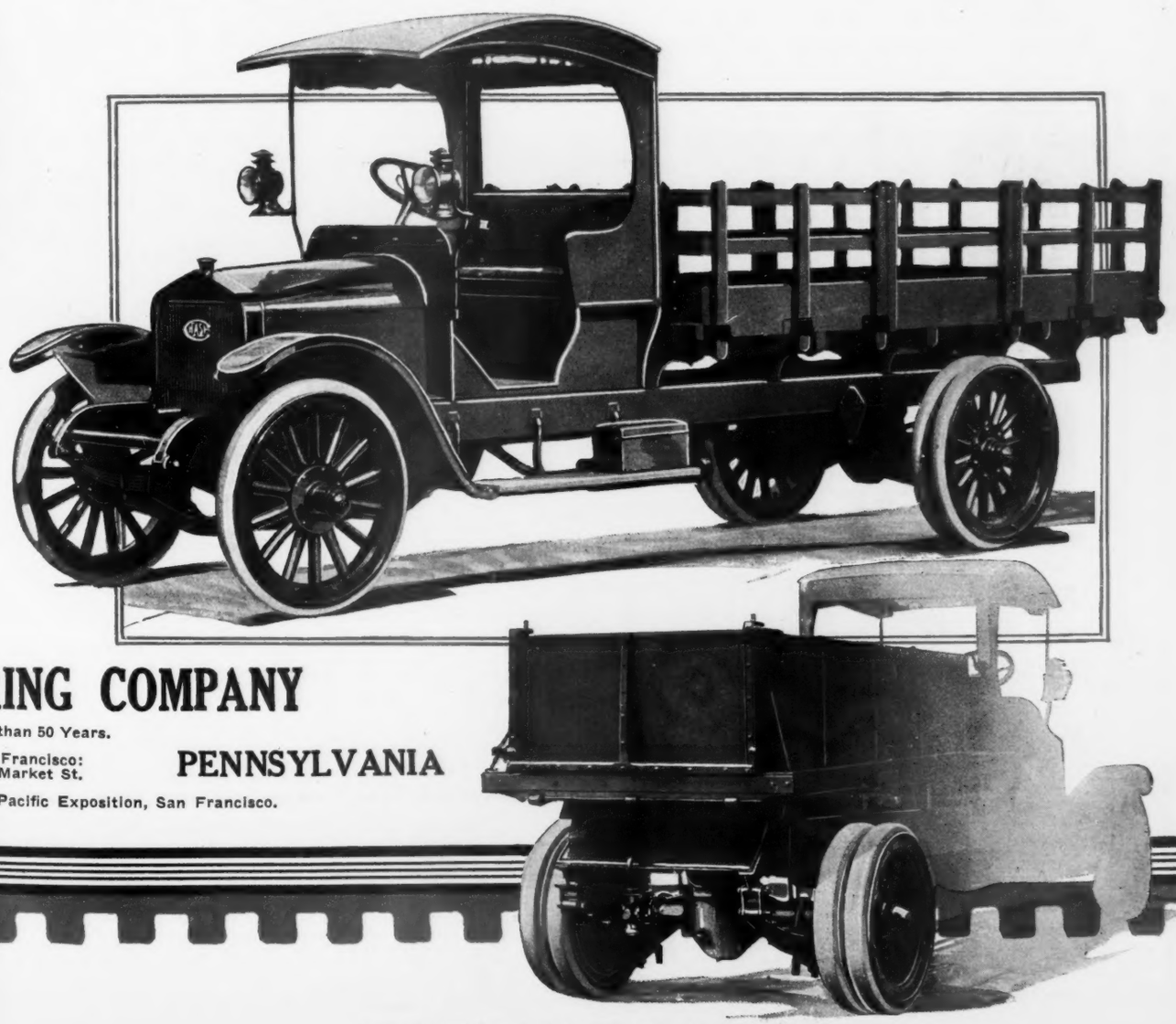
Exhibiting Section 16, Transportation Building.

DON

AR AXLES

CHASE

Two of the prime characteristics of Sheldon design are first the use of ball bearings to carry the worm loads (both thrust and radial) and secondly the employment of the semi-floating type of construction.



SPRING COMPANY

for More than 50 Years.

San Francisco:
444 Market St.

PENNSYLVANIA

Panama-Pacific Exposition, San Francisco.

HERE is a photograph of a fleet of electric delivery wagons and trucks operated by The Delivery Company, of Cleveland, Ohio. Every electric in this fleet is equipped with an "Ironclad-Exide" Battery.

During the month of November, 1913, which was the first month The Delivery Company operated these trucks, they averaged 41 miles per day and carried an average of 181 packages per car per day.

Here is a letter received from the above company a few months ago:

"We are pleased to advise, that we are using some twenty-three sets of your 'Ironclad' batteries in our delivery trucks in Cleveland. The service required of this equipment is rather severe, as we operate upon schedule time for the majority of the Department Stores, and our general delivery system, which serves some two hundred customers.

"A mileage of from fifty to sixty miles per charge is not unusual for some of the longer routes and we find the 'Ironclad' battery rendering a very faithful performance, even under the severe road conditions of this City and after ten months' usage we are very glad to report entire satisfaction with their record."

Electric vehicles equipped with "Ironclad-Exide" Batteries offer a dependable and economical delivery system. Let us co-operate with you in choosing the proper type of battery for your particular service.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of

The "Chloride Accumulator", The "Tudor Accumulator"

The "Exide", "Hycap-Exide", "Thin-Exide" and "Ironclad-Exide" Batteries

New York, Boston, Chicago, Washington
Cleveland, Atlanta, Pittsburgh, Detroit

PHILADELPHIA, PA.
1888-1915

Denver, San Francisco, Seattle, St. Louis
Rochester, Los Angeles, Toronto

There are good reasons why the largest dealers in New York (and many other cities) use

MACK & SAURER TRUCKS

MACK & SAURER trucks have proved their worth to the satisfaction of the biggest coal dealers everywhere. They reduce delivery costs—and increase the profit balance on the ledger.

What our trucks do for coal dealers they can do for you, no matter what your delivery problem may be.

When you consider trucks for your deliveries, consult the Company which has made trucks for the last 19 years, and has 4000 in daily service.

Capacities—1, 1½, 2, 3, 4, 5, 6½, 7½ Tractor Trailers—5 to 15 Tons

Sales representation and service facilities in principal localities.

Send for "MOTOR TRUCKS IN COAL SERVICE"

New York, N. Y.	Philadelphia, Pa.	Allentown, Pa.	Kansas City, Mo.	Baltimore, Md.
Chicago, Ill.	Erie, Pa.	Seattle, Wash.	Portland, Ore.	New Haven, Conn.
Buffalo, N. Y.	Los Angeles, Cal	Albany, N. Y.	St. Louis, Mo.	Jacksonville, Fla.
Boston, Mass.	Newark, N. J.	Huntington W. Va.	San Francisco, Cal.	

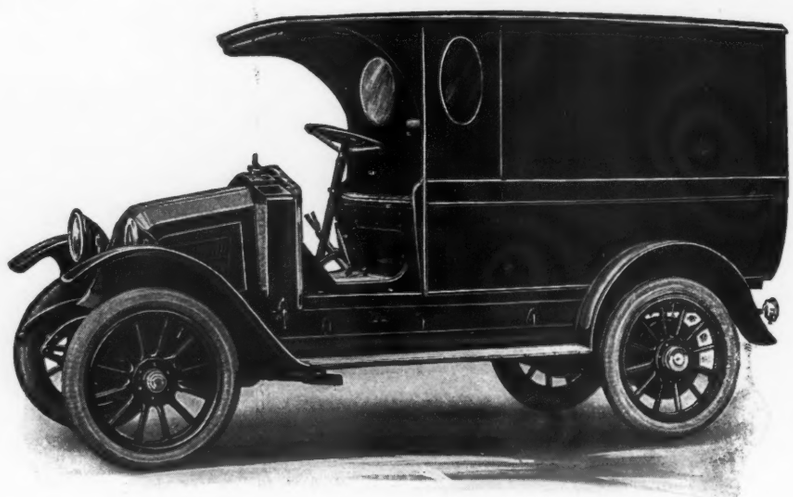
International Motor Company
64th St. & West End Ave.
New York

Export Department:
24 State Street
New York

Mack

LIPPARD-STEWART

Buy Your Truck Not For Today But For Years of Economical Service



Too many delivery cars and trucks are on the market because of good salesmanship, and lack of truck knowledge on the buyer's part.

You, Mr. Merchant Man, cannot afford to buy a truck that is made to sell, rather than to meet your delivery problem with continuous uninterrupted service at low upkeep cost.

A truck proves its value not by the first few months' cost, but by its ability to work at low repair expense year after year. Such service is built into a truck at the factory, not by the selling arguments of the salesmen.

Write us about your delivery problem. Let us refer you to a particular one of over a hundred lines of business that we are now serving.

Let us put you in touch with one of the forty or more concerns that have sent repeat orders. We can help you solve your delivery problem the right way.

LIPPARD-STEWART MOTOR CAR CO.

½ Ton, ¾ Ton, 1 Ton, 1½ Tons, 2 Tons

237 West Utica Street, Buffalo, N. Y.

Chicago—Ropp Motor Co.
Lewiston, Me.—Wade & Dunton Carriage Co.
Pittsburgh—Vulcan Motor Truck & Service Co.
Cleveland—Albaugh Motor Sales Co.
Springfield, Mass.—Baxter & Duckworth Co.
Boston (Cambridge)—A. W. Cox & Co.
Richmond, Va.—T. D. Raney
Racine, Wis.—W. R. Taylor Motor Co.
Philadelphia—S. Bruce Somervell

A Ten Minute Job

Ten minutes in McGraw's free Service Stations will equip each of your wheels with

McGraw Truck Tires

Types—Demountable. Pressed-On.

Styles—Channel Base. Regular Straight Steel Base.

Profile—European—Contains 15% to 20% more usable rubber than others.

Price—Write for special discounts.

Guaranteed 8000 Miles

The McGraw Tire & Rubber Company

East Palestine, Ohio

Branches: New York Philadelphia Atlanta Boston Chicago Kansas City Buffalo Newark

400,000 Miles without a Leak

PULLMAN TAXI SERVICE COMPANY

TOURING CARS. TAXI-CABS.

GENERAL OFFICES AND GARAGE
200-214 S HILAND AVENUE

PHONES
"6200" HILAND
"300" EAST

PITTSBURGH, PA. May 29th, 1915.

Fedders Manufacturing Co.,
Buffalo, N. Y.

Gentlemen:

In reply to your letter of May 28th, kindly be advised that the Old Radiator in question was returned to you sometime ago.

When we use the word "duplicate" in reference to our new radiators, we do not necessarily mean the construction shall be the same as in this old one. All that we desire is a radiator whose outlines are the same as the old one, in order that we may use our present hoods. We wish the construction of the new radiators to be of your best design such, for instance, as you are furnishing the White Co. We would like in fact to have you use a one piece shell and rounded a little on edges. In reference to the radiators on our White Taxi Cabs we might say that we have 10 White Cabs in service each one having traveled over 40,000 miles in the last fifteen months, and we have yet to experience our first leak. It was the above service that led us to you for our new radiators.

Trusting that you will give the above your immediate attention, we are,

Very truly,

PULLMAN TAXI SERVICE CO.

Walter D Laird

FEDDERS QUALITY
RADIATORS

FEDDERS MFG. CO., Inc. **BUFFALO, N. Y.**

Experience proves that heavy-duty trucks should be equipped with

WEST'S CAST-STEEL WHEELS

It doesn't require reports from the seat of war to convince some thousands of American truck users that steel wheels are best for trucks that must withstand unusually severe service. These reports simply confirm what these concerns have learned by personal observation and experiment.

They likewise can tell you of the superiority and predominance of ***West's Cast-Steel Wheels*** by virtue of the same experience. These were the first American steel wheels made and are by far the most extensively used.

Our five years' experience in their production has taught us how to produce wheels that will have the utmost strength and durability, give the greatest service at the least cost and give the least trouble—all at a price no higher than you pay for ordinary wheels.

Let us tell you the advantages in detail.

The West Steel Casting Co., Cleveland, Ohio

Dart

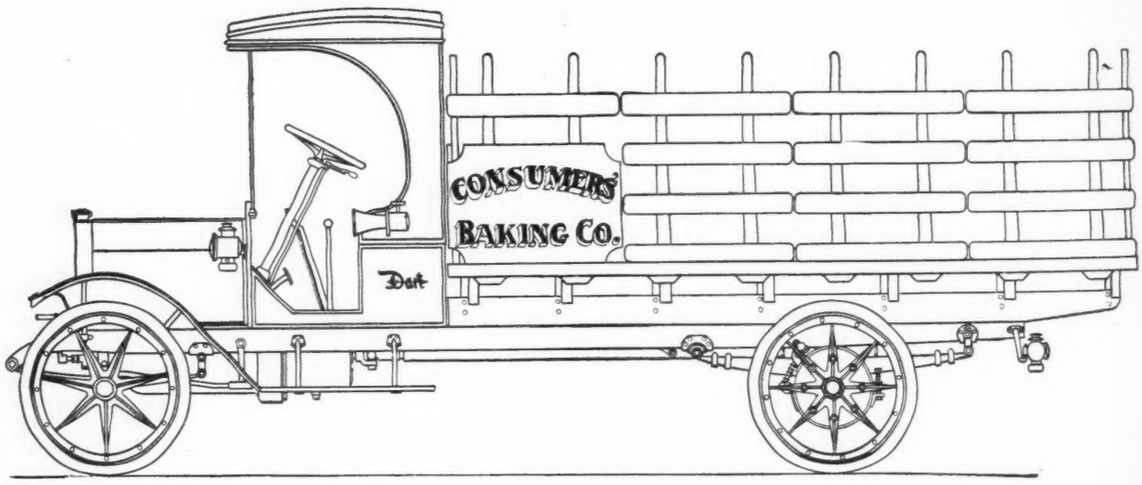
Announcing

the new

2-2½ Ton

Worm Drive $2100

(Chassis)



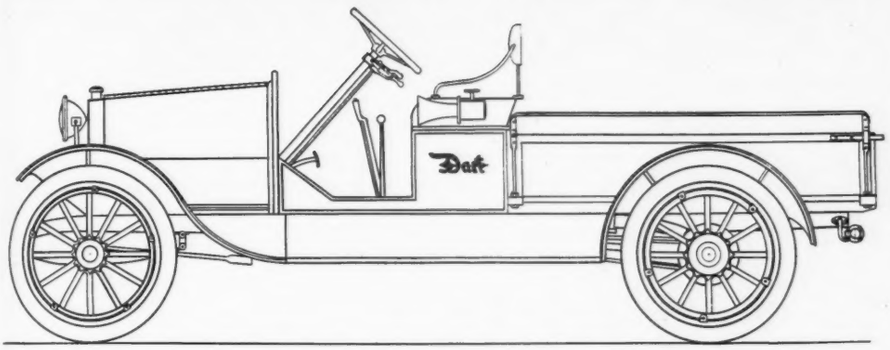
Important Specifications and Features:

150″ Wheelbase, steel wheels, "Resista" Springs; Buda Motor (heavy duty), 4⅛″ x 5½″; Stromberg Carburetor; Eisemann Magneto; Fuller Transmission; Fedders Radiator; 5″ deep Pressed-Steel Frame, ¼″ section; Ross Steering Gear; 36 x 4 Front and 36 x 4 Dual Rear Solid Tires; Minimum load capacity, 4000 pounds, Maximum, 5000 pounds.

Dart Motor Truck Company, Waterloo, Iowa

Dart

Dealers:—



$675.00
(Complete)

Model "D", 750 lbs., Shaft Drive, Light Delivery, with Disco Self-Starter and Electric Lights.

A Truck of a Popular Size—Sold at a Popular Price

We offer a complete line of Dart Models, consisting of 750 pound light delivery; 1000 pound, 1500 pound, 1 ton, 1½ ton and the 2 ton heavy-duty worm drive, ranging in price from $675.00 to $2100.00.

Dart Motor Fire Trucks are and will be big sellers for Dart dealers.

A Model for Every Delivery and Trucking Requirement

The Dart line is an ideal one from the dealer's standpoint. It has quality, reputation, and a long record of achievement back of it that goes far toward making sales.

By having one model on the floor you are representing the entire line of Dart Trucks. Like other wise dealers, you doubtless realize the great advantage of this over representing several different concerns, each producing but one model. "We have a special proposition in sample cars."

The day has passed when you need argue the case of the motor truck against the horse. Motor delivery has proved its superiority, and Dart Trucks have done likewise in their chosen field.

Evidence of this lies in the warm words of praise given by Dart users, and the fact that present Dart dealers made big money and have already re-contracted for the 1916 line. Dart Trucks are in service on six continents, giving satisfaction and creating fame in whatever work they are called upon to do.

Sell Dart Trucks in your locality to hundreds of prospects who are virtually awaiting you. The time is ripe and the Dart line offers you the really big opportunity.

Territory is being closed rapidly.

Write or wire us today about yours.

Dart Motor Truck Company, Waterloo, Iowa

Dart Motor Truck Co., Dept. "J-9"
Waterloo, Iowa

Gentlemen:—

Please send agency proposition and full particulars.

NAME .....

TOWN .....

STATE .....

Among the many interesting scenes in our laboratories, two are here reproduced. The one shows where proportions are figured out to a mathematical certainty, in order that the tires may give the utmost in service. The other depicts the making of miniature tires, which are made by the hundreds, in every process of manufacture, for the purposes of testing to ascertain if everything is up to the high Gibney standard.

It is such precautions as these which make Gibney tires the great service givers that so delight users. You will find it interesting to read our new house booklet, "From Crude Gum to the Finished Tire". It tells all about the making of Gibney Pressed-On and Demountable Tires. Sent on request.

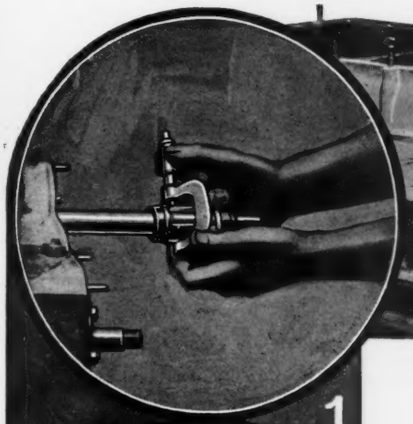
GIBNEY
Tire & Rubber Co.
Factory, Conshohocken, Pa.
BRANCHES:
New York Philadelphia Boston Detroit Chicago London Paris
AGENCIES—Baltimore, Cincinnati, Duluth, Elizabeth, Erie, Harrisburg, Kansas City, Louisville, Milwaukee, Minneapolis, Nashville, Newark, Norfolk, Paterson, Pittsburgh, St. Louis, St. Paul, Scranton, Washington, Wilmington, Worcester.

For Motor-Bearing Work

Bearings can be bored out in absolute alignment and to the exact size of the crank shaft with the

MARTELL A-L-I-G-N-I-N-G REAMER

It takes but one-quarter the time required for hand scraping.



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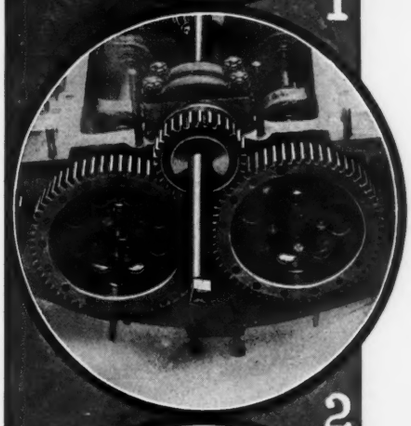

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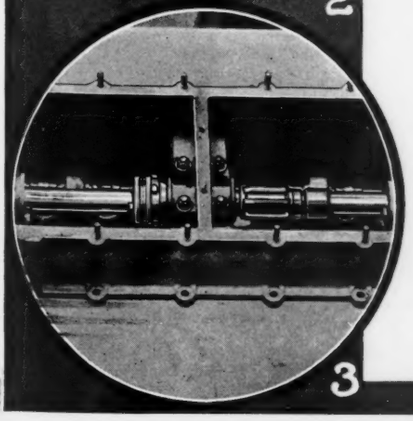


3

An Economy for Motor Fleets

Instead of scraping in the bearings of motors by hand, the service men for any motor fleet can save time and do a better job with the Martell Aligning Reamer. Hand scraping requires from three to five days—reaming only takes one-quarter of that time. Your trucks are ready for service sooner and will stay in use longer. Reaming insures perfect gear mesh, absolute alignment, and accurate size of bearings to fit crank shaft.

Fig. 1 shows how the reamer head may be accurately set by micrometer to bore the exact size of the crank shaft. Fig. 2 shows how perfect gear mesh is obtained by means of the adjustable bushing. Fig. 3 shows reamer ready to bore out bearing No. 2 and shows how alignment is secured by adjustable bushings.

Every fleet owner and every service station foreman should ask for information and prices on this wonderful new reamer. It pays for itself in a short time.

Write now for your copy of "A Better Way to Scrape Motor Bearings".

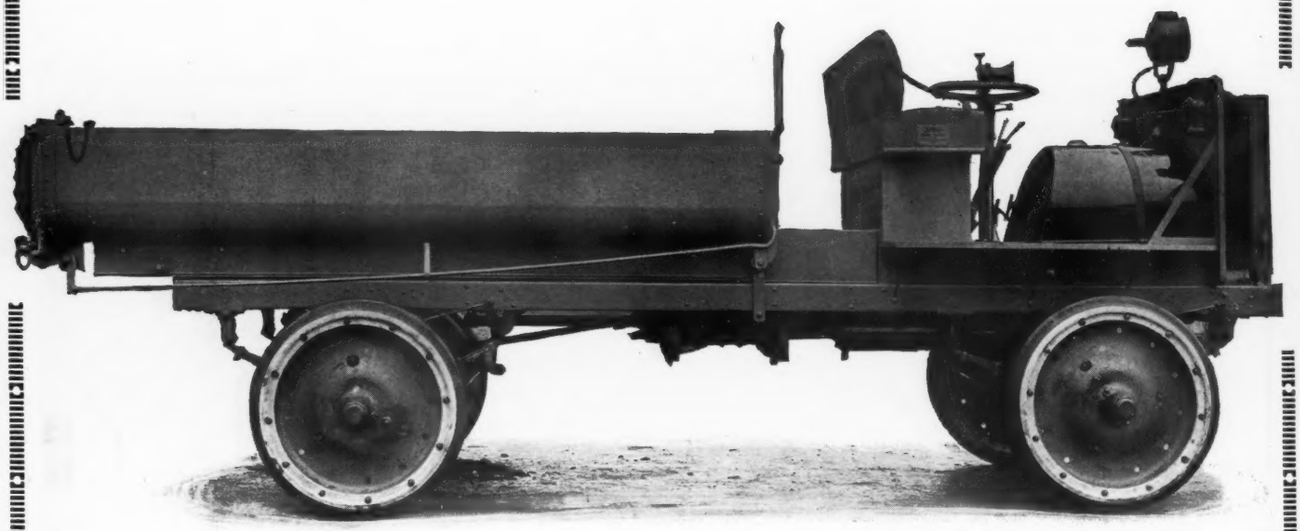
Harding Manufacturing Company, 40 Court St., Boston

67-7

ALSTEL

Steel Bodies for Motor Trucks

Outlast the trucks on which they are placed



Whatever may be your haulage requirements, no matter how unusual or severe the service, we can supply you with steel truck bodies that will be best adapted to your needs and give you dependable and highly efficient service.

Many makers of high-grade trucks, such as the Jeffrey Quad, shown above, use our bodies with the utmost satisfaction. Our hoist-power or hand and dump bodies, in particular, have achieved remarkable success.

Send for our complete data and prices, giving body dimensions and nature of business.

MOTOR TRUCK BODY DEPARTMENT

Variety Manufacturing Co., Sacramento and Carroll Avenues, Chicago, Ill.

When Writing, Please Say—"Saw Your Ad. in the CCJ"

Truck Tires Free

Unless the Goodyear S-V Outwears Any Other

We now extend this Guarantee to October 1st. Many truck owners were not in shape to accept it during April, May and June. And we want every user to have this chance to prove the S-V best.

Equip opposite wheels—at the same time—one with a Goodyear S-V, one with any other standard Truck Tire of like rated size, bought in the open market. If the Goodyear S-V fails to cost less per mile than the other, we will return you its full purchase price, making the S-V free.

Get this guarantee in writing when the tires go on. Equip all the wheels you wish. Compare the Goodyear S-V with every seeming rival in this convincing way. Then you will end all your costly experimenting. Then you will know the truth.

Mileage Warrants Foolish

The habit has been, with us and with others, to give mileage warrants on Truck Tires. But that's unfair, either to you or us.

Small tires can't do what big tires do. No tire on hard roads can match good-road mileage. A mileage warrant is a simple guess on average conditions. And it must be low enough to meet bad situations.

What we can do—what we do—is to guarantee the lowest cost per mile under like conditions. We guarantee that on the Goodyear S-V, against any tire that's built.

Not alone in the limited, cautious way in which mileage is usually guaranteed. Not only on an adjustment basis. The Goodyear S-V is entirely free, however long you use it, if any tire you match against it shows as low a cost per mile.

Why We Dare

We dare do this because we have already made 5000 tests and comparisons. Barring accidents, the Goodyear S-V will surely win against any rival Truck Tire. There are reasons for it. One is more available tread rubber. Another is no creeping, no bulging or breaking, no possible separation. The tread, the backing and the rim are one.

Our local branch will tell you where to get the S-V tires under this signed warrant.

GOODYEAR AKRON, OHIO
S-V Truck Tires

THE GOODYEAR TIRE & RUBBER CO., Desk 94, AKRON, OHIO
Makers of Goodyear Fortified Automobile Tires
We Make Demountable, Block, Cushion, Pneumatic and Other Types of Truck Tires

Veeder HUB ODOMETER

FORM K

$20

Practical Insurance

If it is worth while insuring your trucks against fire, theft, collision and personal injury—and who disputes the value of such insurance—it is even more advisable to insure yourself against mismanagement of your trucks.

The former are possibilities. They may happen and do to some. The majority of trucks, however, are never the basis of a claim. Nevertheless big premiums are cheerfully paid to protect against the possibility.

On the other hand, mismanagement is the fate of nearly all trucks. Careless driving, waste of time, falsified accounts of trips, unauthorized trips, are all a common story. They occur regularly and eat tremendously into profits. Yet you can check up and stop them by simply putting a VEEDER on each truck. Surely *this* perpetual insurance is worth buying when the only cost is the moderate price of the VEEDER. *Write us for particulars.*

At your dealer's, direct from factory, or of the following:

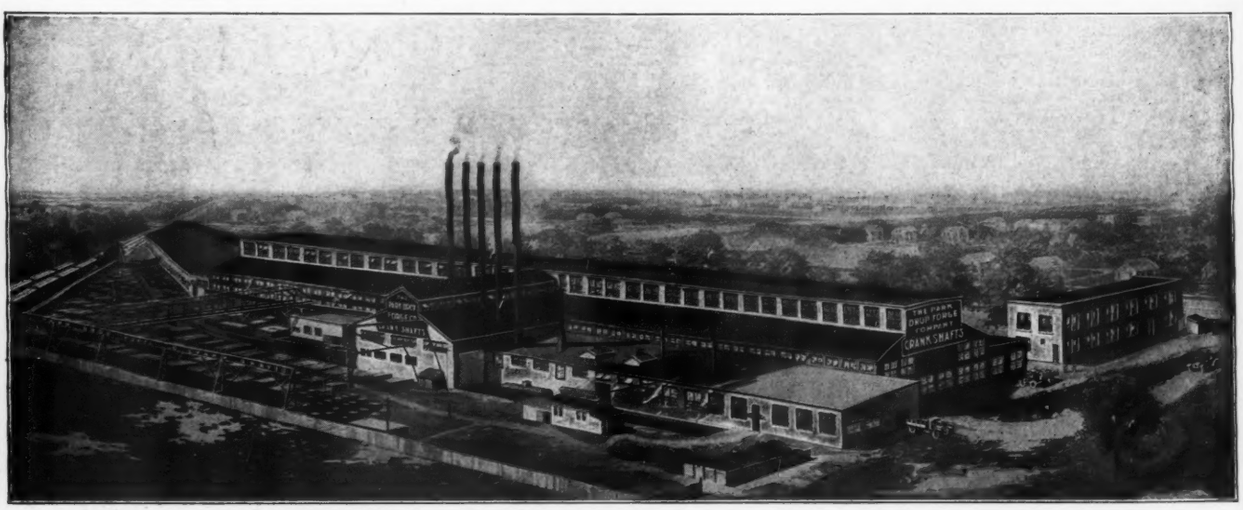
T. H. CRANSTON & CO., 56 E. Randolph St., Chicago
BERNARD I. BILL, 543 Golden Gate Ave., San Francisco, Cal.

The Veeder Manufacturing Company

C. H. VEEDER, President D. J. Post, Treasurer
H. W. LESTER, Secretary

Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Small Die Castings



THE FIREPROOF HOME OF PARK CRANKSHAFTS
TRUCK AXLES—HEAVY DIE FORGINGS

CRANK DROP PARK FORGED SHAFTS

39 Large Hammers and Hydraulic Forging Presses, Chemical and Physical Laboratories, 16 Furnace Heat-Treating Plant

Large Stock Classified Steel—Analysis Checked in Park Laboratory

"Park Forgings" always have been guaranteed as to Chemical Analysis, Physical Properties and Bearing Hardness

CRANK DROP PARK FORGED SHAFTS

THE PARK DROP FORGE CO., CLEVELAND, OHIO

THE **WOOD**

Hydraulic Hoist

Solves the Dumping Problem for

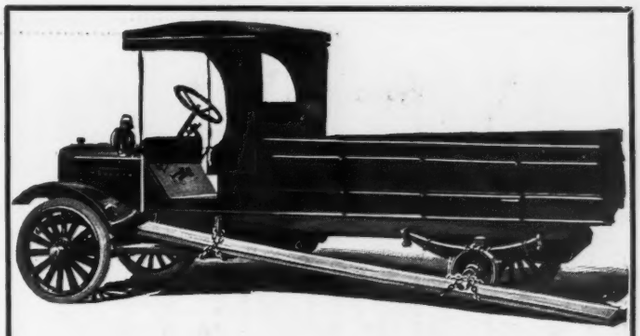
Motor Dump Trucks

4" Piston Rod
Cannot bend or break
Patent Applied For
Shive guards preventing cables leaving pulleys.
Control levers operated from Drivers seat
Large Oil Expansion Chamber 1 gal surplus oil Preventing air getting in pipe & pump system
Pump-Gear Type special design all bearings bronze bushed Shafts hardened & ground
Cylinder Shelby seamless steel tubing
Extra heavy Cross members
Pump shaft bearing brace & chain tightener

Improved Heavy-Duty Type "D" Hoist

"Made in Detroit Only"
by the

Wood Hydraulic Hoist & Body Co.
560 Franklin Street DETROIT, MICH.
Successors to
Wood Hydraulic Hoist Company, St. Paul, Minn.



Horses Are Cheaper Than This

Driver lost control because the brake lining did not grip and hold the load. Truck out of commission for a fortnight. Repairs—$100. That truck will have a bad economy record for the year.

Properly lined brakes are as important as an efficient motor. See that your brakes are lined with Thermoid.

Thermoid
HYDRAULIC COMPRESSED Brake Lining - 100%

Watch Your Brake Lining

Thermoid is brake lining clear through—not merely on the surface. It holds even when worn paper thin. It is cured under hydraulic compression into a solid substance of uniform density and frictional power. Guard your trucks with Thermoid.

Thermoid Rubber Company
Trenton, N. J.

OUR GUARANTEE:
Thermoid will make good or we will.

BRANCHES:
New York Philadelphia
Chicago St. Louis
Pittsburgh Detroit
Indianapolis San Francisco
London Berlin Paris

Cannot be burned out nor affected by oil, heat, water, gasoline, dirt.

THE DOMINANT DRIVE

The transition from chain, bevel gear and other types of drive to worm drive has been so great that the latter is now the dominant drive in the truck field. It is found in nearly all the leading trucks and outnumbers all other types. This position has been obtained because the worm drive has proved its superiority to the other types.

We are the only exclusive manufacturers of worms and worm gears, we make more for automobile drives than any other maker, and we have the largest capacity for their production.

The Cleveland Worm & Gear Company

Cleveland, Ohio

Extreme care in assembling

Buda Motors backs up extreme care in the making of every part. Every man who touches a Buda is a specialist in a certain process under orders to do nothing less than his best.

This is part of the reason for the long life, mileage and service Buda Motors give in thousands of pleasure cars and trucks.

Address BRANDENBURG & COMPANY, Facty. Reps.
57th & Broadway, N. Y. 1112 S. Michigan Ave., Chicago 1311 Dime Bank Bldg., Detroit

THE BUDA CO., HARVEY (CHICAGO SUBURB), ILL.

NO WEAKENING CENTER BOLT

TUTHILL'S TITANIC
SAFETY-FIRST
Patented Feb 15, 1910
Guaranteed Forever Against Center Breakage

NO WEAKENING CENTER BOLT

More Tuthill Springs are used to replace broken truck springs than all other makes combined

BEST FOR MOTOR TRUCKS

Guaranteed forever against center breakage

With Worm-Drive Construction

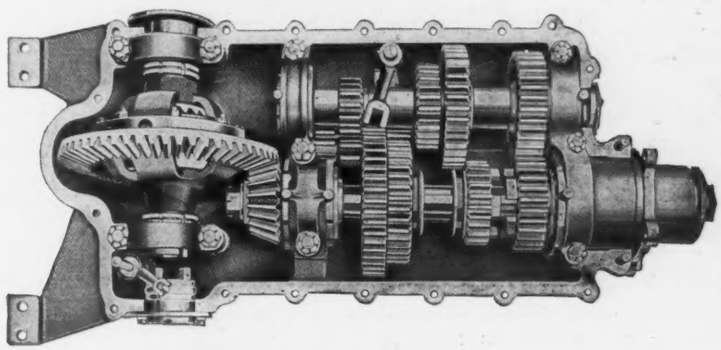
Ask Any Engineer

and he will tell you that the No-Center Bolt Spring is best, because the additional stress of the worm-drive construction causes the center bolt in the ordinary spring to shear off and break in the center.
If you are having any spring suspension trouble, write our Engineering Department — expert advice free upon request.

Quickly and easily adjusted to any truck

TUTHILL SPRING CO., 774 Polk St., Chicago, U. S. A.

WARNER
"THE RECOGNIZED STANDARD"

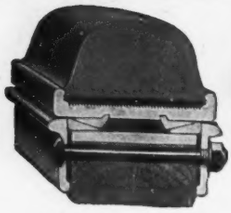


Enduring Service

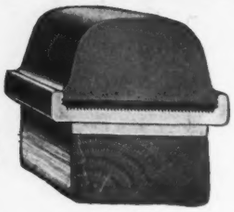
Get this Maximum Service from your Truck
Insist on Warner high-grade transmissions

Detroit Office — WARNER GEAR COMPANY, MUNCIE, INDIANA — 967 Woodward Ave.

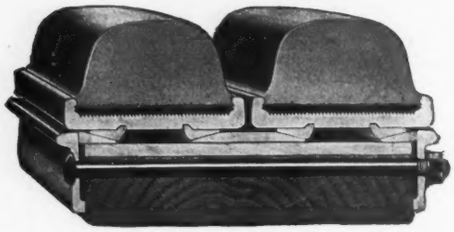
Warner Gear Co. Transmissions



Single Demountable



Single Pressed-On



Dual Demountable

Dual Pressed-On

Kelly-Springfield

TIRES FOR COMMERCIAL VEHICLES

Kelly-Springfield steel-base truck tires in Pressed-on and Demountable types represent the highest development in quickly applied, practical, durable and resilient tires for commercial vehicles, and are built to deliver record mileage under the severest service conditions.

Kelly-Springfield Tire Co.

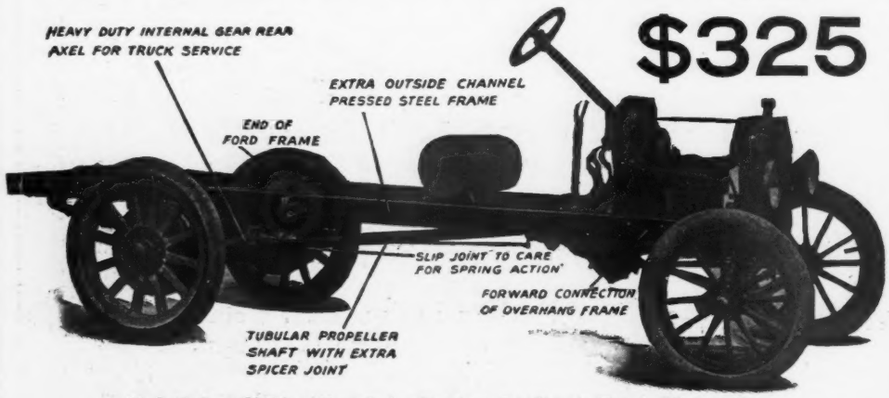
Akron, Ohio

Branches in all Principal Cities

HUDFORD

COMMERCIAL CHASSIS

A UNIT FOR CONVERTING THE FORD INTO A ONE-TON TRUCK


HEAVY DUTY INTERNAL GEAR REAR AXEL FOR TRUCK SERVICE
EXTRA OUTSIDE CHANNEL PRESSED STEEL FRAME
END OF FORD FRAME
SLIP JOINT TO CARE FOR SPRING ACTION
FORWARD CONNECTION OF OVERHANG FRAME
TUBULAR PROPELLER SHAFT WITH EXTRA SPICER JOINT

$325

Weight of complete job, 2100 pounds (Weight of HUDFORD UNIT crated, 800 pounds); H. P. 23; Wheelbase, 120 inches; Frame, 10 feet 8 inches; Heavy Truck Springs; Internal-Gear Heavy-Duty Rear Axle. The drive is by large tubular propeller shaft, with extra universal slip joint at rear end to take care of spring action. Truck Wheels; Solid Tires or Pneumatic as desired. Geared 7 to 1 or 6 to 1 as desired. The rear wheels of the Ford, with their larger tires, are put on the front, otherwise the forward construction of the Ford car remains entirely unchanged.

The HUDFORD can be attached in a few hours.

Cut shows the **FORD** Chassis after being converted by the HUDFORD UNIT into a one-ton truck chassis—shaded portion is HUDFORD UNIT.

How Weight Is Distributed

90% of the load is carried on the rear truck axle and frame which constitute the HUDFORD UNIT—the front of the Ford car carries practically no more weight than it would as a Ford touring car.

U. S. Patent Claims Allowed, Applications Pending in Foreign Countries

DEALERS! The HUDFORD UNIT lists at $325, making it possible for you to furnish your customers with a one-ton truck for $650. We do not require quantity orders—trade discounts being given to dealers ordering a demonstrator.

WE WILL BE READY SHORTLY TO SUPPLY UNITS FOR OTHER MAKES OF CARS

HUDFORD COMPANY, 635 North Broad Street, PHILADELPHIA, PA.

LONG COOLING SYSTEMS

CO-OPERATION with the engineering department of the best manufacturers of motor trucks and tractors has enabled us to develop and perfect many improvements which make our product the highest quality on the market and within a price that is more than consistent with same.

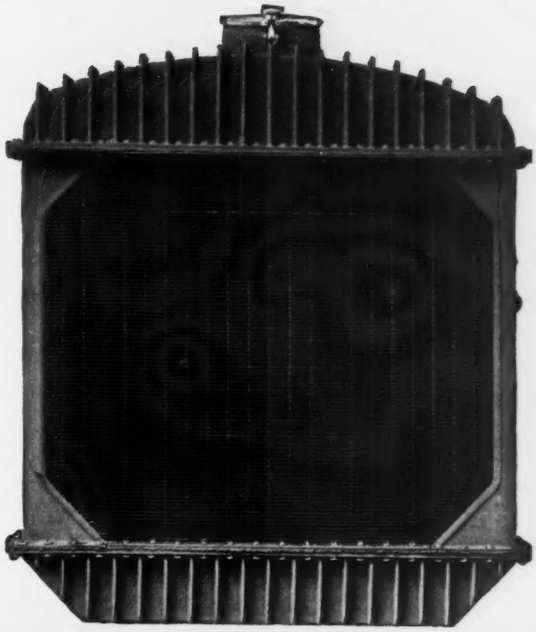
With our large, modern, fully-equipped plant and efficient organization we can guarantee production sufficient to meet the demands of the largest manufacturers and in accordance with our agreements.

Several types of Long Cooling Systems are made—Cellular, Flat Tube, Honeycomb, Spiral Tube, Fin and Tube

Write for catalog. Or—if you wish, we will gladly send our representative to confer with you relative to your radiation problem.

LONG MFG. COMPANY

DETROIT MICHIGAN



Tube and Plate Type for Truck Service

"The Spring Is the Thing"

MATHER SPRINGS

Scientifically Heat-Treated

Genuine made only by

The Mather Spring Company

Toledo, Ohio

This Line Will Make Money for You

There are great money-making possibilities in the Krebs line for any dealer who is energetic enough to turn distinctive points of superiority and exceptional value into sales.

The Krebs Line consists of four models, as follows:

Model F, ¾ Ton
Model G, 1 Ton
Model H, 2 Ton
Model H, 3 Ton

KREBS TRUCKS

The quality of Krebs trucks is shown by these standard units: Timken-David Brown Worm Drive, Continental Motor, Brown-Lipe Transmission, Timken Axles and Bearings, Bosch Ignition, Parish & Bingham Steel Frames. They also have *exclusively* the wonderfully efficient and economical Automatic Governor.

We can make room for a few more dealers of the right sort. Write us about your territory.

The Krebs Commercial Car Co.
Clyde, Ohio

TRUCK SPRINGS

There's a great difference in both the character and duration of service obtained from various makes of springs.

That difference is due to the quality of materials employed, the method of treatment, the equipment of the producing plant and the knowledge and workmanship involved.

THE SPRING PERCH COMPANY, ever since the inception of the automobile industry, has enjoyed an enviable reputation as the leading manufacturer of QUALITY SPRINGS, both for pleasure and commercial vehicles.

The company is equipped with furnaces of most recent and perfected models, affording absolute pyrometer heat control, and in the fabrication of SPRING PERCH CO.'S springs a unique and up-to-date equipment is employed, while thoroughly tested modern methods cover each operation.

Spring Perch Co., Bridgeport, Conn.

Berling Magneto

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Built for Cylinder

Aeroplanes Automobiles
Auto Trucks Motorcycles
and Motor Wheels

MANUFACTURERS CAN GET NECESSARY INFORMATION FROM

ERICSSON MANUFACTURING CO.
1116 MILITARY ROAD, BUFFALO, N.Y.

Baker Electric Trucks

The vitally interesting thing about a Baker Electric truck is its satisfactory service at low upkeep cost.
It can do your work better at less cost.
Convincing facts are yours for the asking.

THE BAKER R & L COMPANY
CLEVELAND

Manufacturers of Baker and Rauch & Lang pleasure cars and Baker trucks

Theres no leak proof ring but the LEAK-PROOF Ring — insist

Cut the Cost of Truck Operation

You may think you've worked your costs down to bed-rock, and no further economies are practicable excepting at a sacrificing of efficiency. Well—frankly—you are wrong there, if you've neglected to equip those trucks with

Piston Rings

Made by McQuay-Norris Mfg. Co.

And, besides, you're overlooking a chance to very materially increase the reliability of this service.

LEAK-PROOF Piston Rings ensure the continuous production of a motor's maximum power output! They prevent all waste of gasoline and lubricating oil, eliminate the troubles caused by excessive carbonization, reduce cylinder and motor wear.
They are mechanically correct in design, having neither the unsealed openings nor unequal bearing of all one-piece rings, nor the weaknesses of the multiple-section type. They are strong, enduring, wonderfully elastic—easy to adjust.

Send for FREE Book

"To Have and To Hold Power." It tells all about piston rings and why you should equip your motor with LEAK-PROOF. How it will pay you in fuel economy and prolonged motor life. Write for it.

In Use on Over 300,000 Motors

Angle to angle interlocking construction identifies LEAK-PROOF—insist

Sold by all up-to-date dealers, garages and repair shops

MANUFACTURED BY

McQuay-Norris Mfg. Company
Dept. C, St. Louis, Mo.

CANADIAN FACTORY: W. H. Banfield & Sons, No. 120 Adelaide St. West, Toronto

BRANCH OFFICES:

NEW YORK, 1919-29 Broadway at 64th St. SAN FRANCISCO, 164 Hansford Bldg.
PITTSBURGH, 902 Second Nat'l Bank Bldg. LOS ANGELES, 224 Central Bldg.
KANSAS CITY, 513 New Nelson Bldg. DALLAS, 509 Juanita Bldg.
CHICAGO, Suite 718 Michigan Blvd. Bldg. ST. PAUL, American Nat'l Bank Bldg.

Look for the name LEAK-PROOF stamped on the Ring

RYERSON REINFORCED
GLYCO PATENTED SKELETON CONSTRUCTION
BEARINGS

for automobile, motor boat, tractor and stationary gas engines and other machinery where a removable and quickly replaceable bearing is desired.

Finished Bearing

A reinforced Babbitt bearing embodying enormous **strength** and **resistance.** A steel or bronze skeleton embedded in the **Babbitt** changes weakness to strength — just what steel reinforcement does to concrete.

Section showing reinforcement

Reinforced and interlocked throughout body and flanges —skeleton and Babbitt one homogeneous mass.

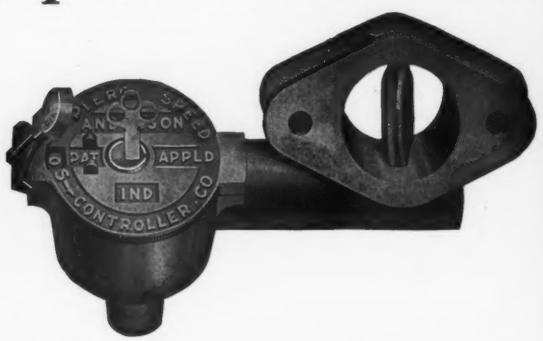
Demand Ryerson Reinforced Bearings in those vital parts of your engine—the connecting rod and main shaft bearing. The whole engine is no stronger than its weakest part. Inferior bearings make an inferior engine.

JOSEPH T. RYERSON & SON
Iron Steel Machinery
Chicago New York St. Louis

Steel or bronze skeleton, used in combination with whatever Babbitt metal is preferred.

Our Skeleton Bearing Construction is Patented Here and Abroad

PIERCE
Speed Controller



THIS is one of the three most efficient and extensively used speed controlling devices made in this country. The other two are also Pierce products. Some one of them should be on every truck you own. Write us for information.

PIERCE SPEED CONTROLLER CO.
Anderson, Indiana, U. S. A.

SPLITDORF
COMMON SENSE SPARK PLUGS

Awarded

SILVER MEDALS

—the highest award in their class—

at the

Panama-Pacific International Exposition

SPLITDORF ELECTRICAL Co.
NEWARK, N. J.

(All SPLITDORF features are fully covered by patent or patents pending)

GEARS

For every kind of service where quality is paramount.

Van Dorn & Dutton superiority rests on these six points:

We know by experience
We produce in quantity
We manufacture complete
We machine complete
We cut only to specifications
We deliver on time

See that the Van Dorn & Dutton

Quality Mark

is on your gears and complete differentials.

Write us today

THE VAN DORN & DUTTON CO.
GEAR SPECIALISTS
NEW YORK CLEVELAND SAN FRANCISCO

When a Man Buys a Truck

the first thing he wants to know is what kind of a motor it's got. He wants to be sure first of all of the power plant. He wants a motor with a record behind it, a motor that other truck owners have tested out for him, that they have found stands up to the grind of hard, gruelling work day in and day out, year in and year out.

Wisconsin Motors

have won their high standing because of the service they have given. They are durable, economical, dependable.

TYPE T-U
4" BORE
6" STROKE
INTAKE VIEW

Wisconsin Motor Mfg. Co.
Station A, Dept. 320
Milwaukee
Wisconsin

Write now for special catalog

TYPE U-U
4¼" BORE
6" STROKE
EXHAUST VIEW

TOO LATE

after your Electrical Equipment breaks down, to avoid delays and expense of repairs. But your lights and starting motor would not have failed you if you had installed a

Weston
(Model 354)
AMMETER
On Your Dashboard or Cowl

It keeps you posted every minute regarding the recharging or discharging of your storage battery. It gives you warning of approaching trouble. Its exact information is invaluable—the cheapest and best insurance you can buy.

Write for full information, which will show you plainly the risk you run in operating the electric plant on your truck or car without a Weston Measuring Instrument.

Weston Electrical Instrument Co.
22 Weston Avenue, Newark, N. J.

New York	Boston	Chicago	Toronto	Berlin
Buffalo	Philadelphia	Detroit	Winnipeg	London
Cincinnati	St. Louis	Denver	Montreal	Paris
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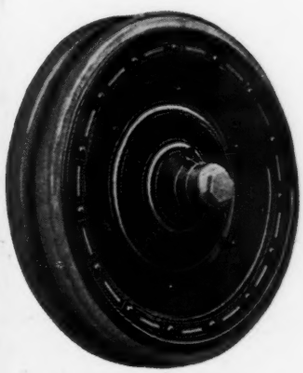
BESCO

STEEL WHEELS

The Ideal Wheels for Heavy-Duty Trucks



38x4" Dual. Wt. 275 lbs.
With 24" Drum, Cast Solid.

Among their many advantages are the following:

Come machined, ready for tires and bearings; adaptability to all drives; greater strength; equal distribution of strain; absolutely true; lighter in weight; not affected by climate; faster, neater, cleaner, do not pick up mud, snow or ice; cost no more, though better.

The capacity of our foundry and machine departments have been increased so that we can now turn out 12 sets of wheels per day. Send for catalog and data.

BUCHANAN ELECTRIC STEEL CO.
BUCHANAN, MICH.

PLAIN COMPRESSION
(Patented)

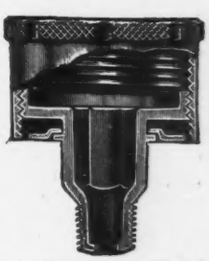
Empress

BRASS AND STEEL
GREASE
AND
OIL CUPS

WE MANUFACTURE
a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.

Catalogue on Application



LEATHER PACKED
(Patented)

Bowen Manufacturing Co.
AUBURN, N. Y.

ROWE
MOTOR TRUCKS

are used in every line of business and in every case have proved the most economical means of hauling.

A Rowe Truck will save you money in transporting your merchandise.

The Rowe Truck is guaranteed to give

Continuous Economical Operation

Worm or chain drive. One to five tons capacity

Rowe Motor Manufacturing Co.
Downingtown, Pa.

USE ALL YOUR FUEL

Don't put up any longer with that old-fashioned, riveted gasoline tank. Sooner or later it's bound to spring a serious leak and then fire or explosion is mighty apt to result. Even now it may be leaking, slightly indeed, but enough to make a difference between the gasoline you buy and that actually used for power. Make your truck fire and explosion proof, and get the use of every drop of fuel by using

"JASCO TANK"

JASCO
SAFETY FIRST
TANKS

The drawn steel, seamless, tinned and tested gasoline tank that cannot leak under any service. All styles and sizes. At your dealer's or direct.

JANNEY, STEINMETZ & CO.
Main Office: PHILADELPHIA
New York Office: Hudson Terminal Building

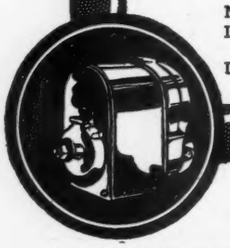
EISEMANN

OF THE 93 manufacturers who use Eisemann magnetos in this country, 69 are truck makers.

If you are not one of the 69 Eisemann users you are not getting the greatest possible ignition efficiency.

The Eisemann Magneto Co.
Sales and General Offices
32-33rd Street, Brooklyn, N.Y.

New York, 245 West 55th Street
Indianapolis, Ind., 415-417 North Capitol Ave.
Detroit, Mich., 802 Woodward Ave.



Spicer Universal Joints

Universally Accepted as the Most Dependable Flexible Connection Known to Motor Car Practice

Oil-Tight Dust-Proof

PARTS INTERCHANGEABLE

Spicer Manufacturing Company
South Plainfield, N. J.

Sales Representatives:
K. Franklin Peterson, 122 S. Michigan Blvd., Chicago
L. D. Bolton, 2215 Dime Savings Bank Bldg., Detroit
Foreign: Benjamin Whittaker, 21 State Street, New York

SIGNAL
MOTOR TRUCKS

4 Models
2 Lengths Wheelbase

Worm Drive—1 Ton $1500 (Chassis)
Worm Drive—1 1-2 Ton $1750 (Chassis)

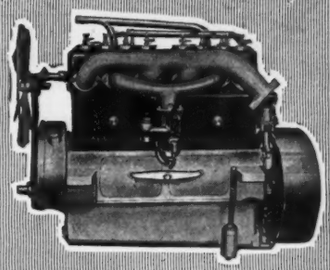
Worm Drive 3 1-2 Ton
$3000 (Chassis)

Signal Motor Truck Co.
Detroit, Michigan

MAKE your guarantee of truck efficiency mean what it says. The truck equipped with the Waukesha Long-Stroke Truck Motor fulfills every promise your guarantee makes—because it's a motor with unlimited capacity for hard work—because its strength combats abuse and carelessness and keeps down the upkeep expense to the minimum—because it consumes less fuel than any other motor, and because it's strictly a **truck motor.**

The Waukesha possesses strength to a most unusual degree. The crankshaft is of double-heat treated nickel-chrome steel, with tensile strength of 70 tons. That metal is exclusively our own process. So, too, is the metal from which the Waukesha

WAUKESHA
4¼×6¾" Long Stroke Truck Motor



bearings are made—they have greater resistance than Parsons' White Brass. The construction of the motor as a whole has the comparative strength of these two parts.
The truth regarding the Waukesha Motor makes fascinating reading or the truck manufacturer. Ask us!
WAUKESHA MOTOR CO. Dept. A. WAUKESHA, WIS.

Philadelphia
THIN PLATE BATTERIES
"Diamond Grid"

CAPACITY ECONOMY — DIAMOND GRID TRADE MARK — LIFE MILEAGE

For Pleasure and Commercial Cars
For Sparking, Starting and Lighting

WRITE FOR CATALOGUE

Philadelphia Storage Battery Company
ONTARIO AND C STREETS
PHILADELPHIA, PA.

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MINNEAPOLIS	KANSAS CITY, MO.	ST. LOUIS
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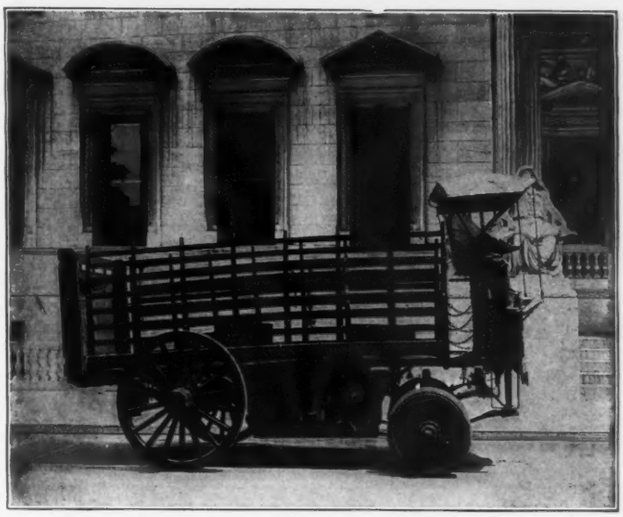
OAKLAND	CHICAGO	PORTLAND, ORE.
SAN FRANCISCO	LOS ANGELES	SACRAMENTO



Boston, Mass.

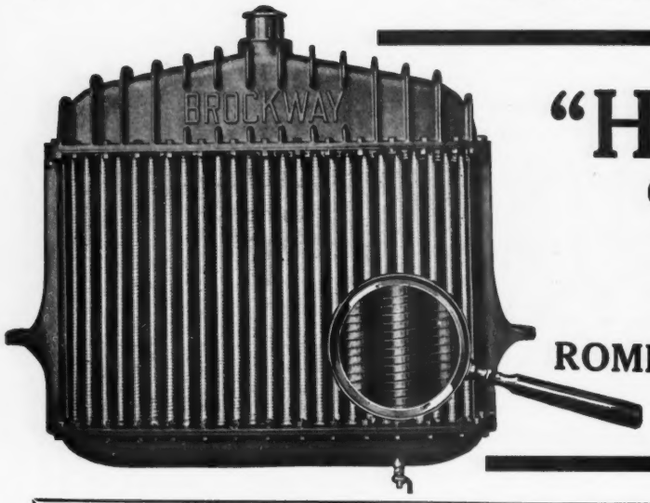
Gentlemen:

We have your letter of the 16th inst. in relation to the "Couple-Gear" truck used by this Company, and would state, we have been using one for a period of over two years and it has worked out very satisfactory, so much so that we purchased a second one and I believe our New York Office has since that time purchased either two or three. We use the two wheel drive with battery, as it answers our purpose very well and the tire expense is minimum in our opinion.

Yours truly,
National Fire Proofing Co.
Walter M. Evatt, Vice-Pres. and Mgr.

This economic type of wagon is saving money for others, why not for you? Let us tell you more about it.

COUPLE GEAR FREIGHT WHEEL COMPANY
420 Buchanan Ave., Grand Rapids, Mich.
Boston, 179 W. 1st St. New York, 30th St. and 11th Ave.
Philadelphia, 522 Weightman Building



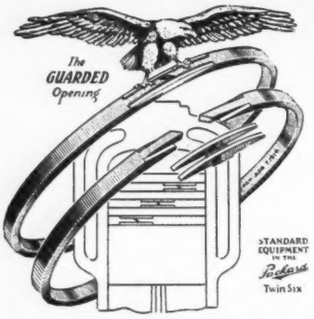
"HELICAL TUBE"

Cooling Sections are guaranteed for the life of the motor on which they are installed.

Manufactured only by

ROME-TURNEY RADIATOR COMPANY

JASPER STREET ROME, NEW YORK



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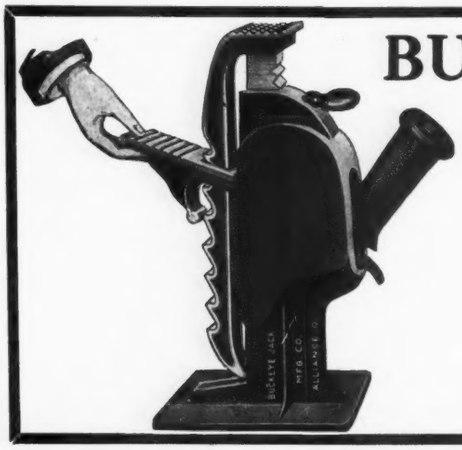
Synonymous with Economy

In Truck operation and maintenance. Ask for proofs

The saving will be worth the effort

Sales Offices in all Principal Cities

BURD HIGH-COMPRESSION RING CO., ROCKFORD, ILLINOIS



BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼″	6½″	18″	16 lbs.	2½ tons	with formed handle	$10.00
13	14¼″	7½″	20½″	26½ "	3 "		15.00
14	14¼″	7½″	20½″	33 "	5 "		16.00
14	11½″	7½″	20½″	35 "	5 "		22.50

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO. - Alliance, Ohio

DEALERS!

Grasp this money-making opportunity. We have some valuable territory open.

U. S. MOTOR TRUCKS

THE correctness of its construction combined with best quality materials and right prices, make the U. S. a splendid value for buyers and a good proposition for dealers.

Send for catalogue and agency proposition

CAPACITY 2, 2½, 3, 4 TONS

THE UNITED STATES MOTOR TRUCK COMPANY, Dept. "A" CINCINNATI, OHIO

A Shim Is—

As Necessary as a Wrench

Motor truck service is hard. Bearings frequently require adjustments. Shims are thus as necessary in the shop as a wrench. Make your shims from

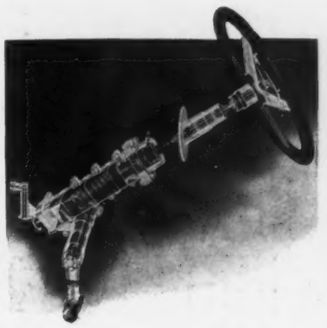
LAMINUM
the MATERIAL for SHIMS

and you'll save time, trouble, labor and expense. Don't waste time filing a solid shim! Don't fool with troublesome loose-leaf shims! Don't waste money on new shims! Be economical. Be practical. Save time, labor, expense. Use LAMINUM! It's the work of a moment—just peel off with your knife enough of these .002" laminations to get the desired thickness. Result—a smooth surface, uniform thickness, perfect adjustment, an unspoiled bearing surface—a first-class job with little work or cost.

LAMINUM comes in various forms and thicknesses. We put up a trial assortment that will just suit you. Write for prices and data.

Laminated Shim Company, Inc.
539-41 Canal Street - New York

ROSS
Steering and Differential GEARS
will help sell your trucks



They are STANDARD on good motor truck construction

INVESTIGATE
our new complete line of fore and aft steering gears

Enormous bearing surfaces
Perfect lubrication
Best material throughout
Finest workmanship

Built in the largest and newest steering gear factory in the United States.

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ROSS GEAR & TOOL COMPANY
790 Heath St. :: Lafayette, Ind.

SCHWARZ WHEELS
Patented

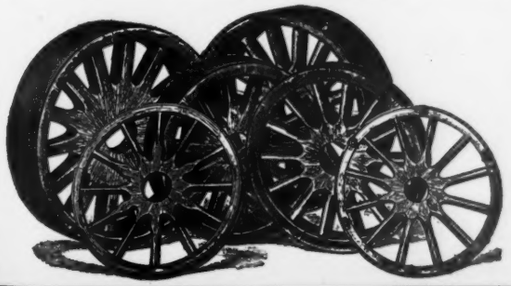
Used by the makers of most quality trucks, because they offer the utmost in strength, safety and economy.

Desired by truck buyers, because they are a known product whose superiority has been conclusively demonstrated.

Wanted by dealers, because they are an assurance of quality and make a truck easier to sell.

"Bear the Burden"—a booklet—will tell you why this is so—send for it.

The Schwarz Wheel Co.
Frankford Philadelphia Penna.



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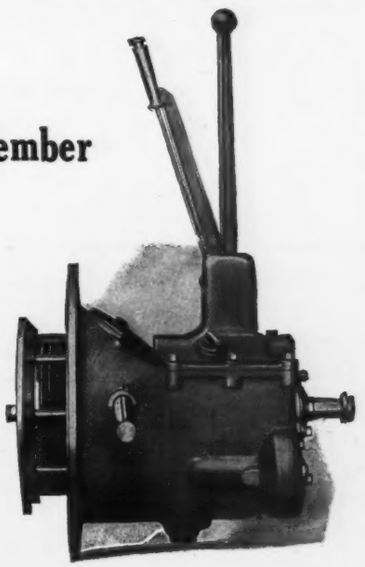

Trucks
¾ to 2 Tons
2 Sizes

Complete details on request

FULLER & SONS MFG. CO.
KALAMAZOO, MICH.

Pierce-Arrow Motor Trucks Did the Work Faster and Cheaper Than Any Other Equipment He Could Have Employed

In October, 1912, one standard 4-yard Pierce-Arrow dump truck was delivered to the John F. Casey Company of Pittsburgh, Pa. This was used as auxiliary to their teams and for general emergency purposes.

When the company was awarded the contract for excavating and constructing the Cabbage Hill Reservoir in the East End of Pittsburgh, their experience with this one Pierce-Arrow truck had proved so satisfactory that they purchased six more of the same make.

The work was started on June 20, 1914, and finished December 1, 1914, well ahead of the specified time. From the source of supply of materials the trip loaded averaged 3.5 miles up a 7% grade, and the roads were poor. The trucks worked an eleven-hour day and averaged sixteen trips each day. They hauled 5,000 tons of coal, machinery and miscellaneous freight—85,000 tons of sand and gravel and 47,000 barrels of cement.

Mr. John F. Casey, president of the company, stated upon completion of the contract that the Pierce-Arrow trucks did the work faster and cheaper than any other equipment he could have employed.

PIONEER WORM DRIVE

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO NEW YORK

G. V. ELECTRIC TRUCKS

SIX MODELS: 1,000 POUNDS TO 5 TONS

Nearly 5,000 in use
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General Vehicle Company, Inc.

GENERAL OFFICES AND FACTORY
LONG ISLAND CITY, NEW YORK

NEW YORK::CHICAGO::BOSTON::PHILADELPHIA

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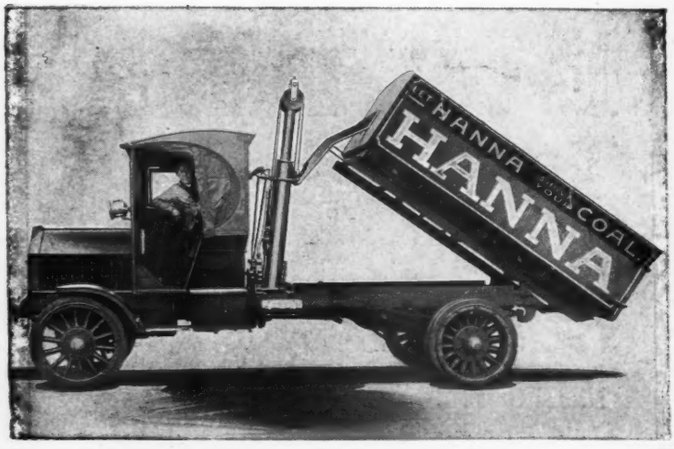

The Latest Type
Wood Hydraulic Hoist

made to fit any chassis. Will dump a load in thirty seconds. Great time saver in hauling coal and building material.

Write for our descriptive booklets and prices

Hydraulic Hoist Mfg. Co.
172 West Fifth Street Saint Paul, Minn.
Original builders and successors to Wood Hydraulic Hoist Company

LAVIGNE STEERING GEARS

The Peer of Gears
For quality Motor (cars) (trucks)

We are Steering Gear specialists.

We command the largest percentage of the Steering Gear business.

All of our product is made of the highest grade materials, all working and wearing parts made from alloy steels, pack hardened, water and oil treated, ground to gauges. Insuring interchangeability, easy steering and irreversibility.

The Value is honest
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The Sale sincere

Write for detailed information.

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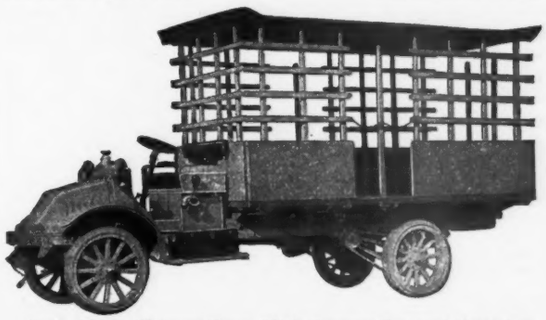
HIGHLAND BODIES
For STYLE and SERVICE

Highland Bodies are built to give the maximum of service per dollar of cost. And out of a long experience, we are able to produce bodies to fit any given kind of business as closely as though they had been built especially for each individual case.

The range of types is wide—we have five distinct catalogs to cover it. Write, stating the kind you are interested in, and the proper booklets will be sent you.

Incidentally, dealers are finding the Highland line a very profitable adjunct to their business, producing a good profit with little extra work.

The Highland Body Mfg. Company
908 Elmwood Place **Cincinnati, Ohio**



Stake Body, Chicago Type, With Canopy Top and Curtains

Part of Fleet of 11 Stewarts in the Service of the Buffalo News

Stewart
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"Absolute Satisfaction"

That's what owners everywhere write about their Stewart trucks. They testify that Stewarts save money—give continuous service—cost practically nothing for repairs—run more miles on a gallon of gasoline than other 1500 pound delivery trucks—and more miles on a set of tires.

If you haven't our booklet "How Motor Delivery Pays," write today for a copy.

Dealers: Ask us about our attractive proposition in open territory.

Stewart Motor Corporation. Buffalo. N.Y.
Makers of Pleasure and Commercial Cars (12)

Double the Value of Your Truck

Keep your expenses where they are, but double your deliveries by hitching a Troy Trailer to your motor truck. That divides your costs and multiplies your capacity. Stop carrying and start hauling. Capitalize the drawbar pull of your truck. Make one truck do the work of two. Every truck can pull more than it can carry if it has the right type of Trailer. Troy Trailers are proved by performance. Write for booklet 4 CCJ.

THE TROY WAGON WORKS CO., Troy, Miami Co., Ohio

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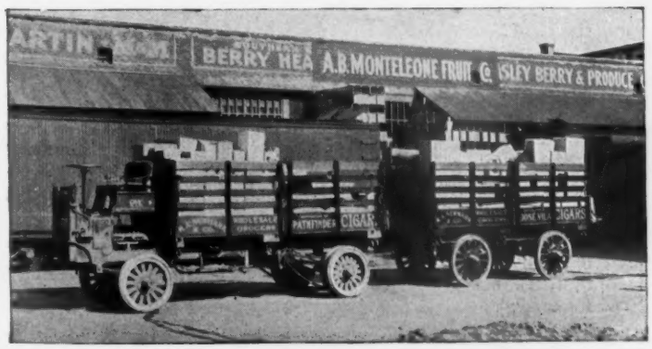

M. A. Newmark & Co., Los Angeles, Cal., made total deliveries of 20 to 25 tons a day with a five-ton truck. The use of a Troy Trailer raised their deliveries to 50 tons daily and divided the cost per ton.

Makes Motor Damage Impossible

BOYCE MOTOMETER

Can be attached to the radiator cap of your truck in five minutes, and will absolutely prevent scored cylinders or burned-out bearings, caused by lack of proper lubrication or insufficient water in the radiator. Also prevents gasoline waste from overcooling in winter. Write for particulars.

TRUCK MODEL, PRICE $5.00

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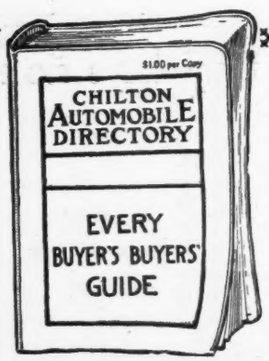
CONTINENTAL MOTOR TRUCK CO.
CHICAGO
WORM DRIVE FIVE SIZES 1 TO 4 TONS

THE PARISH & BINGHAM COMPANY
Cleveland, Ohio
The Standard of Quality and Service
Automobile Frames and Large Steel Stampings
Our Engineering Force At Your Disposal



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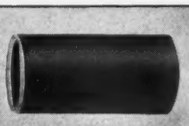
Do not continue to use an issue after it becomes old and obsolete—order a New Copy at least once a year. If you continue to use the book after it is nine months or a year old, you will be wasting time and postage writing to dead names. It is issued in **January, April, July and October.**

PRICE, $1.00 PER COPY

CHILTON COMPANY :: Market and Forty-ninth Streets, Philadelphia, Pa.

Trade-Mark "Bound Brook" Reg. U. S. Pat. Off. Graphite and Bronze Oil-less Bearings

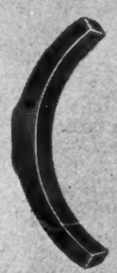
Trade-Mark "Nigrum" Reg. U. S. Pat. Off. Graphite Impregnated Wood Oil-less Bearings

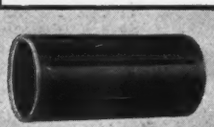


Engineers and truck makers are invited to investigate the advantages of "Bound Brook" and "Nigrum" Oil-less Bearings and Bushings for use on all places where oil is objectionable or lubrication difficult.

They require no oil, grease or attention, afford perfect lubrication and last indefinitely.

"Bound Brook" Oil-less Bearings are the original self-lubricating bearings and have been used for many years with marked success by leading truck makers, engine builders, etc. Send for catalog.





GRAPHITE LUBRICATING CO.
North Main Street Bound Brook, N. J.
(All genuine Graphitol Oil-less Bearings have always been made at Bound Brook, N. J. in the United States of America)

When Writing, Please Say—"Saw Your Ad. in the CCJ"

BESSEMER TRUCK

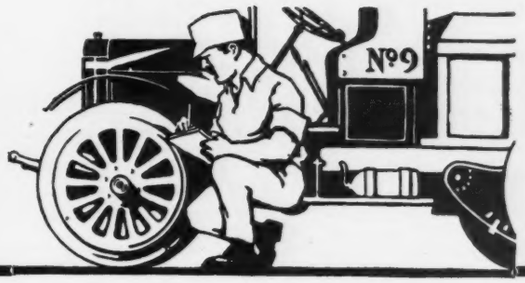
Illustration shows Model "C" which is equipped with either pneumatic or solid tires. There is more real sturdiness built into this than in any other one-ton truck on the market.

Three Models

MODEL C	MODEL A	MODEL D
1 Ton Capacity	1½ to 2 Ton Capacity	1½ to 2 Ton Capacity Worm Drive
25 H. P.—$1250	30 H. P.—$1800	30 H. P.—$2300

DEALERS: Write us about the special proposition we have for you. The Bessemer line enables you to handle every truck requirement.

BESSEMER MOTOR TRUCK CO.
GROVE CITY, PA.



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Figures do not revolve—always right side up. Grease- and dirt-proof—glass window keeps clean on the inside.

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(Hub Odometer)

is also guaranteed indestructible. The heavy cast housing and wide air space protect the mechanism from damage by collision.

Highest award at Panama-Pacific International Exposition.

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AMERICAN TAXIMETER CO.
Mfrs. of Jones and Popp Taximeters
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FAFNIR BEARING COMPANY
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The United Line

DEALERS—
"Unite With
The United"

2 ton Worm-Drive Truck - -	$2250
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Nothing Experimental—
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UNITED MOTOR TRUCK CO. Grand Rapids Michigan

Profit-Seeking Dealers

cannot afford **not** to look into the new

ATTERBURY

proposition — it spells profit to you—and **repeat** sales

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Jeffery Armored Quad

Drives, Brakes and Steers on All Four Wheels

The Jeffery Quad negotiates mud, sand, snow and hills impassable to rear-wheel-drive trucks. Its superiority demonstrated in a spectacular way in European War. Adopted by eight governments and by big business concerns as rapidly as the trucks can be built in the Jeffery plant. Write for free haulage data.

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Thoroughly Reinforced

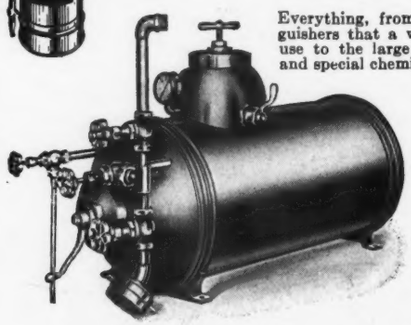
Unusual Strength—High Efficiency

The Candler Special Truck Radiator is the strongest construction on the market to-day. It is highly adapted to truck use, by virtue of its efficiency, strength and durability, non-leakable and non-freezable features as well as its ease of repair.

We invite correspondence from those interested in a Practical and Serviceable Truck Radiator.

CANDLER RADIATOR COMPANY
DETROIT, MICH.

DEPENDABLE Chemical Fire-Fighting APPARATUS



Everything, from the hand extinguishers that a woman or child can use to the large Chemical Engines and special chemical tanks for Fire Department service.

Into each is put material and workmanship that cannot be excelled. Designs are shown by actual use to be beyond improvement.

Result: Perfect and immediate action when needed, no deterioration from lack of use or age.

All Our Tanks Are Made of Copper

The name **"CHILDS"** stands for perfection.

Chemical Tanks for Fire Department or other service made to order.

Write for our Complete Catalogue and interesting talk on Fire Apparatus.

O. J. CHILDS CO., Utica, N. Y.
MANUFACTURERS FIRE APPARATUS

"ALWAYS ON THE JOB" Standard DETROIT USA HEAVY-DUTY DOUBLE-DUTY TRUCKS

DEALERS:

"Standards" are the result of many years experience in designing and building high-grade, heavy-duty motor trucks. Send for Booklet B-27 describing all capacities.

Standard Motor Truck Co., Detroit, Mich.

The Ideal Motor for Trucks Up to One Ton Capacity

THE RUTENBER MOTOR

This new model is a splendid proposition for makers of light commercial cars, as it enables them to install a thoroughly efficient high-speed motor at a cost that permits of an attractive selling price. Descriptive circulars and full information on request.

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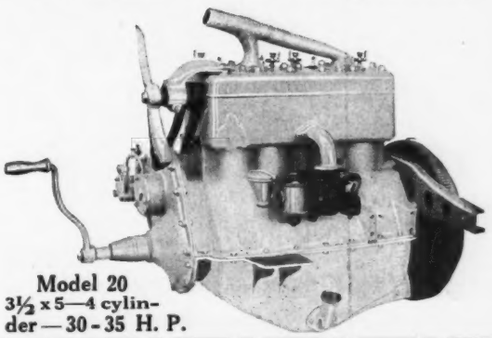

Model 20
3½ x 5—4 cylinder—30-35 H. P.

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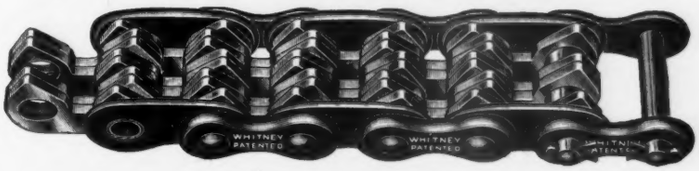
in stock and to order.



For Block, Roller and High Speed Silent Chains.
New Catalog.

Cullman Wheel Co., 1351 Altgeld St., Chicago

CRAMP BUSHINGS

Bushings, of all things, should be of proven quality. Truck Builders who aim to build faultless service and long life into their cars take no chances, they use CRAMP BUSHINGS, made of the famous Cramp Special Bearing Bronze.

Cramp Bushings have highest compressive strength and real anti-friction qualities. We are prepared to furnish bushings machined complete, ready for installation or the ingots and rough castings as you may desire.

Endow your car with the Cramp reputation by specifying Cramp Special Bearing Bronzes. Write us about it.

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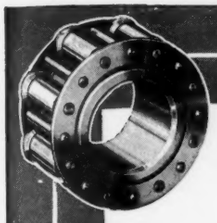
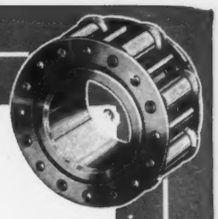
The name COVERT is an assurance of service and satisfaction. It stands for quality. It represents efficiency. It signifies simplicity of construction. It assures durability. It indicates the greatest transmission value. It means economy in assembling and of operation. It's the name that will help sell your product.

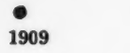
We make transmissions for all types of pleasure cars and trucks. Consult our engineers concerning your requirements.

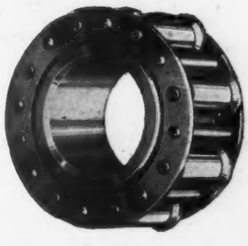
COVERT MOTOR VEHICLE COMPANY
FACTORY, LOCKPORT, N.Y. SALES OFFICE, DETROIT, MICH.



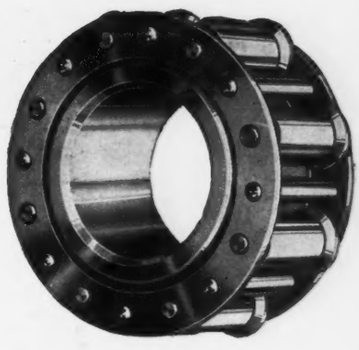


One Bower Bearing cannot differ from another by 1/160 the thickness of the white line in the border





1914



1915

The Irresistible Onward Sweep of the Bower Roller Bearing

The above represents graphically the consistent and gratifying increase from year to year of the business of the Bower Roller Bearing Company. In seven years it has grown 4700 per cent. Today this company provides bearings for nearly 100 leading car manufacturers of the United States.

Bower
Roller Bearing Co.
Detroit - - - - Mich.

Write for complete information and list of users

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American Made for American Trade

Are made in four types, each in a variety of sizes calculated to meet every motor car requirement, and every New Departure Ball Bearing is *Guaranteed* in respect to material, precision and finish.

The New Departure Single Row is internationally standardized and therefore interchangeable with any foreign or domestic bearing of equal width, diameter and bore.

For Your Convenience, New Departures are stocked at our factory, at our Detroit Branch and in 49 trade centers of the United States, Canada and England.

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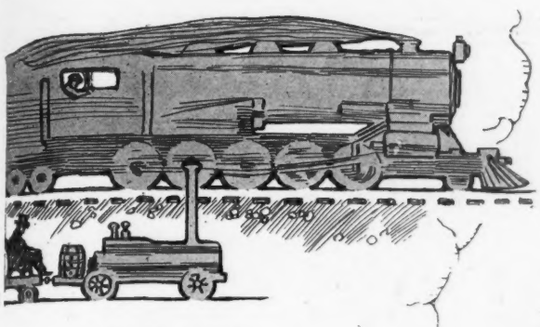

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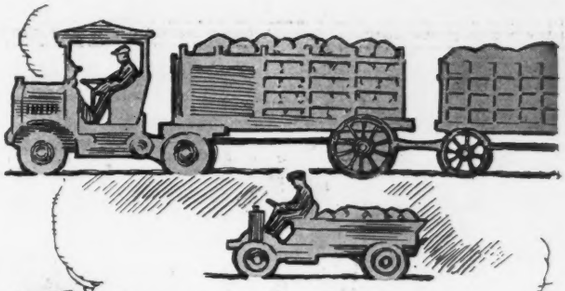
"GIANT OF THE RAILWAY"



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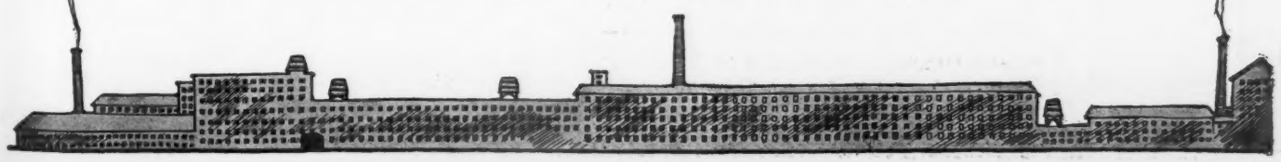

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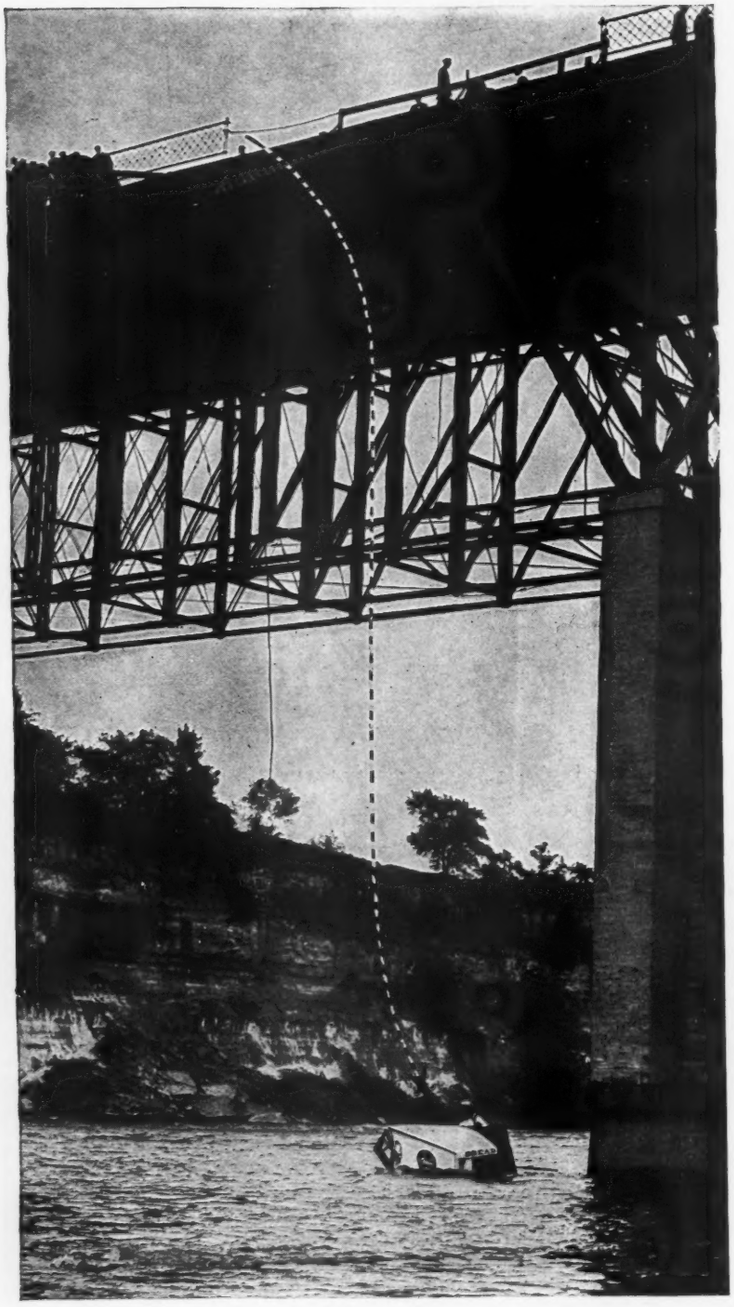

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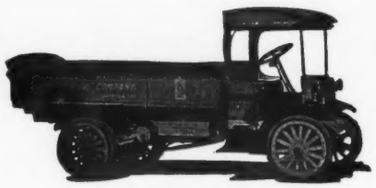

appeal to the man who has had experience in the use of motor trucks.

To him their quality points, the individual clutch transmission, guaranteed springs, self-starter, etc., mean a definite saving in operating costs.

The full line, 1 to 6 tons, with all its features, is described in our complete catalog, which will be sent you on request.

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A live axle to transmit the power.
All working parts enclosed and dust proof.
Absolute quietness of operation.
Highest degree of efficiency obtainable.
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It's worth while getting these points in detail. Our new book covers the whole subject. Send for it.

Celfor Tool Company
BUCHANAN, MICH., U. S. A.

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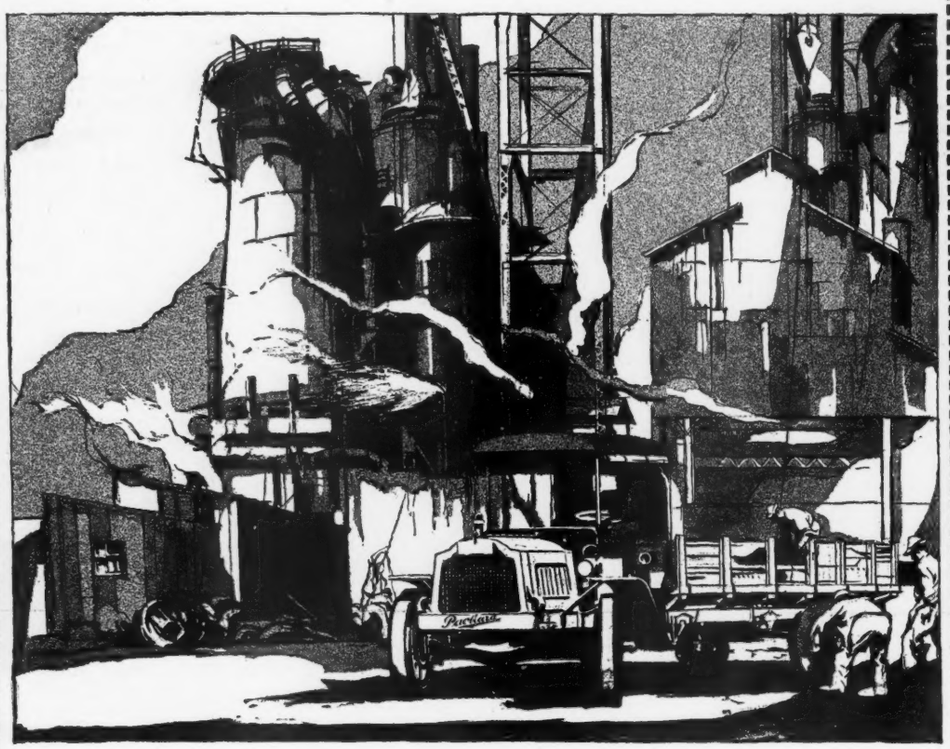

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